

# THE AUTOMOBILE

## "NEXT THE BIG TOUR OF THE YEAR"

**D**ETROIT to-day is the Mecca of Autodom. Thither are headed those who will participate in the annual tour of the American Automobile Association, involving the winning of the Glidden, Hower and Detroit trophies. The first of these is historic in American automobiling, and the 1909 winner will earn his honors in a more strenuous test than has ever been projected in the way of a prolonged endurance tour in this country.

From Detroit to Kansas City, by the route to be followed, the distance will exceed 2,600 miles, and the roads met with will embrace good, bad, and indifferent, with possible wet-weather complications to add to the trials and tribulations of cars and drivers. In July 'tis likely to be hot.

But the great Middle West will enjoy the spectacle of a big contest tour, which unquestionably will add to the prestige of the motor-driven vehicle and bring to the attention of thousands its pleasurable necessity.

Preceding the official start of the tour on Monday morning next, there will be several days of "doings" in the "City of the Straits," which has prepared an elaborate program such as might be expected from a city of Detroit's importance in automobiling. 'Tis really the capital of American motordom, for its enormous factories turn out most of the thousands of cars being produced.

That many will visit Detroit for the sole purpose of seeing the start, is known to be the case, for the hotel accommodations of the city have been tested to their limit, to accommodate the excess of visitors.

Once upon a time, in the palmy days of cycling, Detroit entertained the League of American Wheelmen. Now it is to be the host of the autoists who have succeeded the lowly cyclers; and, mayhap, a decade hence, the same hospitable city will stretch forth the hand of welcome to the aerial brigade in one of its annual gatherings.

It is notable that the conditions for the 1909 tour are wholly dif-

ferent from those of former years. For the first time the Glidden trophy is up as a prize for an individual, to be held by him for one year. It will no longer go to a club nor be competed for by teams. In order to permit of this and of the increased distance, it was necessary that the deed of gift be altered and this was done with the consent of the donor, Charles J. Glidden, who will be on the tour.

Besides the Glidden trophy there are two others, each of which becomes the permanent possession of its winner this year. First of these is the Hower trophy for runabouts, and this will be the third Hower trophy to be awarded. The other prize is a new one offered under unusual circumstances. It is a trophy for the miniature tonneau car making the best score and is known as the Detroit cup. In appreciation of the honor of having the tour start from their city the members of the Detroit Board of Commerce agreed to donate a trophy to be competed for by miniature tonneau cars. The Mayor and Common Council of the city got ahead of the merchants, however, and for the first time on record an appropriation from the city treasury was voted for a trophy, without the matter being referred to a committee. The Common Council voted \$250 for the prize and a committee, headed by Mayor Breitmeyer, was appointed to make the purchase. The Mayor found the sum insufficient and added \$250 from his private purse.

The rules for 1909 are more strict than any former set, and cars will be penalized in fractional marks for any work done on them. All the extra parts and tools carried will be listed, an observer will ride on each car, and there will be an inspection of the parts and tools at the finish and perhaps during the tour. The system of penalization has been worked out by tenths of a point, so as to make it reasonably certain that a winner will be evolved, and yet no car be heavily penalized for repairs that are trivial and quite ordinary. The cars will be divided



into five comprehensive classes this year, separated as follows:

- Class A—Cars listed at \$3,751 and upwards.  
 Class B—Cars listed at \$2,451 to \$3,750 inclusive.  
 Class C—Cars listed at \$1,751 to \$2,450 inclusive.  
 Class D—Cars listed at \$1,000 to \$1,750 inclusive.  
 Class E—Cars listed at \$999 and under.

Henry Souther, the well-known technical expert, and Joseph Tracy, noted both as an expert and a driver, will serve with Chairman Hower on the special technical committee.

### THE LIST OF PARTICIPANTS

About fifty cars will participate in the 1909 tour. The entries July 4 numbered forty-seven, and to this will be added several post-entries, mostly non-contestants. Herewith is the rather incomplete data available just before going to press:

#### FOR THE GLIDDEN TROPHY

No.	Car	Entrant or Driver	Address
1	Premier	Webb Jay	Chicago
2	Premier	George A. Weidely	Indianapolis
3	Chalmers-Detroit	William Bolger	Detroit
4	Marmon	H. C. Marmon	Indianapolis
5	Marmon	Frank E. Wing	Boston
6	E-M-F	E-M-F Company	Detroit
7	E-M-F	E-M-F Company	Detroit
8	E-M-F	E-M-F Company	Detroit
9	Maxwell	E. G. Gager	Tarrytown, N. Y.
10	Jewel	C. F. Bernhart	Massillon, O.
11	Pierce-Arrow	F. S. Dey	Buffalo
12	Pierce-Arrow	W. C. Winchester	Buffalo
14	Gilde	A. Y. Bartholomew	Peoria, Ill.
15	Thomas	Gus G. Buse	Buffalo
16	Midland	E. O. Hayes	Moline, Ill.
17	Stoddard-Dayton	Dayton Motor Car Co.	Dayton, O.
18	Stoddard-Dayton	Dayton Motor Car Co.	Dayton, O.
19	White	H. N. Searles	Cleveland

#### FOR THE HOWER TROPHY

100	Moline	C. H. VanDerVoort	East Moline, Ill.
101	Moline	J. A. Wicke	East Moline, Ill.
102	Moline	Sylvester Gregory	East Moline, Ill.
103	Brush	Frank Briscoe	Detroit
104	Brush	Frank Briscoe	Detroit
105	Chalmers-Detroit	J. Machasky	Detroit
106	Hupmobile	F. Stineman	Detroit
107	Maxwell	Charles Goldthwaite	Tarrytown, N. Y.
108	Pierce-Arrow	J. S. Williams	Buffalo
109	Pierce-Arrow	C. Schofield	Buffalo
110	McIntyre	Frank Goodwin	Auburn, Ind.
111	Stoddard-Dayton	Dayton Motor Car Co.	Dayton, O.
112	Jewel	Jack Shimp	Massillon, O.
114	Mason	F. S. Duenenberg	Des Moines, Ia.
115	Lexington	J. C. Moore	Lexington, Ky.
116	Stoddard-Dayton	Dayton Motor Car Co.	Dayton, O.

#### FOR THE DETROIT TROPHY

51	American Simplex	Simplex Motor Car Co.	Mishawaka, Ind.
52	Chalmers-Detroit	Chalmers-Det. Mot. Co.	Detroit
53	Premier	H. O. Smith	Indianapolis

#### NON-CONTESTANTS

75	General Service	Rapid Truck	Pontiac, Mich.
76	"The Automobile" & "Motor Age"	Thomas	N. Y. & Chicago
77	77 Diamond Rubber Co.		Akron, O.
78	B. F. Goodrich Co.		Akron, O.
79	Press	Maxwell	Tarrytown, N.Y.
80	Press	Maxwell	Detroit, Mich.

#### OFFICIAL

98	Pilot	E-M-F	Detroit, Mich.
99	Chairman's Car	Premier	Indianapolis, Ind.
97	Pilot	E-M-F	Detroit, Mich.
96	Secretary and Starter	Acme	Reading, Pa.

### ITINERARY OF THE 1909 A. A. A. TOUR

July 12	Detroit to Kalamazoo	142.3 miles.
13	Kalamazoo to Chicago	173.3
14	Chicago to Madison	175.2
15	Madison to La Crosse	154.4
16	La Crosse to Minneapolis	177.8
17 & 18	Remain at Minneapolis	
19	Minneapolis to Mankato	132.0
20	Mankato to Fort Dodge	138.6
21	Fort Dodge to Council Bluffs	181.0
22	Council Bluffs to Kearney	200.2
23	Kearney to Julesburg	206.2
24	Julesburg to Denver	204.8
25 & 26	Remain in Denver	
27	Denver to Hugo	173.5
28	Hugo to Oakley	165.0
29	Oakley to Salina	199.7
30	Salina to Kansas City	212.8

Total mileage ..... 2,636.8 miles.

The route is indicated more fully by the following itinerary, giving the principal places passed between the night stops:

Detroit, Ann Arbor, Jackson, Battle Creek, Kalamazoo, Mich.; South Bend, La Porte, Ind.; Chicago, Waukegan, Ill.; Racine, Milwaukee, Madison, La Crosse, Wis.; St. Paul, Minneapolis, Mankato, Minn.; Fort Dodge, Council Bluffs, Iowa; Omaha, Fremont, Grand Island, Kearney, Cozad, North Platte, Neb.; Julesburg, Fort Morgan, Denver, Colorado Springs, Hugo, Col.; Sharon Springs, Oakley, Hays, Salina, Topeka, and Kansas City, Mo.

For the benefit of those who will want to communicate with the tourists a list is supplied telling where to address mail at various places. This is as follows, the date of the tourist's arrival being given first:

July 12	Kalamazoo, Mich.	Burdick House.
" 13	Chicago, Ill.	The Annex.
" 14	Madison, Wis.	Avenue Hotel.
" 15	La Crosse, Wis.	Stoddard Hotel.
" 16	Minneapolis, Minn.	West Hotel.
" 19	Mankato, Minn.	Saulpaugh Hotel.
" 20	Fort Dodge, Iowa	General Delivery.
" 21	Council Bluffs, Iowa	Grand Hotel.
" 22	Kearney, Neb.	General Delivery.
" 23	Julesburg, Col.	General Delivery.
" 24	Denver, Col.	To be announced later.
" 27	Hugo, Col.	General Delivery.
" 28	Oakley, Kan.	General Delivery.
" 29	Salina, Kan.	General Delivery.
" 30	Kansas City, Mo.	To be announced later.

Express packages should be sent to the hotel when one is given as the mail address. At Fort Dodge, Iowa, express matter should be sent care of the station agent of the Great Western Railroad. At Kearney, Julesburg, Hugo, Oakley, and Salina, anything sent by express may be addressed in care of the Union Pacific station agent.

### HOW SLEEPING CARS WILL SERVE AS HOTELS

Every year there has been trouble finding suitable over-night accommodations for the two hundred and odd tired, dirty, and hungry participants of the tour, but this year the problem was a really formidable one, owing to the size of some of the places



Moline Dreadnaught Squadron Which Will Compete for the Hower Trophy





Contestants in the Sixth Annual A. A. A. Reliability Touring Contest Will Traverse Ten States

where it is necessary to call a halt. These details Chairman Hower of the A. A. A. touring board had to wrestle with and settle, and he finally found that the only way possible to run the tour over the chosen route would be to engage sleeping and dining cars, to be side-tracked at the night stops from Fort Dodge to the finish, which will be ten and a half days. The Pullman people would not permit the cars to be summoned and dismissed at will, so that after they are once brought into requisition they will have to be used (or at least paid for) even in the places where hotel accommodations are to be had. The arrangements call for six sleeping cars, three dining cars, and a headquarters car for the officials and their outfit. At Council Bluffs a baggage car will be added for the use of the tire makers who send along supplies. Although the sleeping and dining cars will be used at Council Bluffs, the headquarters will be at the Grand Hotel. The tourists will sleep in the Pullman berths and will get not only their dinner at night and their breakfast in the dining cars, but also will receive each day a lunch put up in a box. Concerning the arrangements for the Pullman cars Chairman Hower has issued a special notice to participants which, in part, reads:

"There has been some difficulty in making arrangements with the Pullman people, but through the efforts of F. C. Donald, commissioner of the Central Passenger Association, we have been successful in completing what promises to be very satisfactory arrangements. For the ten-and-one-half days the contestants will rely on the Pullman service, there will be a charge per day of \$7.45 for each person, making a total of \$78.23 for each person for the entire number of days. This charge includes breakfast, lunch, dinner, and lodging. Quite naturally it was necessary for us, in completing these arrangements, to agree to pay the Pullman company the entire amount prior to the start, as they must complete their negotiations for the entire trip."

This price, it is estimated, is not more than it usually has cost the tourists per day, all told, when they stopped at the big hotels.

The Pontchartrain hotel, where Chairman Hower is now located, is the headquarters at Detroit.

#### DETROIT WILL SUPPLY GRAND SEND-OFF

DETROIT, July 6—Visitors to Detroit during "Glidden tour days" will be afforded an impressive object lesson on the hold the automobile has taken on local enthusiasts. One week before the actual opening of the festivities in connection with the A. A. A. tour, nearly one thousand automobiles had been entered in the big parade for Saturday July 10, which it is planned to make the crowning event of the occasion. It is expected that when the lists have been completed, this number will have been

exceeded, and that the greatest spectacle in the history of the industry will result. More than \$700 worth of valuable trophies will be awarded the best decorated cars in each division, there being eight prizes in all. These are:

The most beautiful car in the parade, any description.  
The best decorated car driven by a lady.  
Best decorated electric car and second best.  
Best decorated gasoline or steam car and second best.  
Best decorated commercial vehicle and second best.  
First, second and third best decorated motorcycles.

In addition, several hundred dollars will be distributed in prizes to contestants in the athletic events taking place at Belle Isle at the conclusion of the parade. The parade will start on North Grand Boulevard, at 1:30 Saturday afternoon, the route being through the center of the city to Jefferson avenue and east to Belle Isle, where a panoramic picture of the procession will be taken. Following this will be the inter-factory athletic con-

Possibly the most enjoyable feature of the "Glidden tour days" entertainment (inasmuch as it will take the guests away from shop talk and familiar scenes and give them a new conception of the advantages enjoyed by the hub of the automobile industry will be the boat ride to be tendered tourists and others on Sunday on the steamer *City of Cleveland*. The boat will leave the city at noon, running down to Lake Erie, turning about and going up past the city and across Lake St. Clair to the St. Clair Flats, the Venice of America, returning to Detroit early in the evening, so that the tourists will be able to

The festivities will open with a banquet Friday evening at the Hotel Pontchartrain, to tourists, A. A. A. officials, and visiting newspaper men, at which it is promised that something more than good feelings will be uncorked. The committee in charge

Indications are that Detroit will be invaded by the most representative body of automobile men it has ever had the honor of entertaining. All the accommodations planned for have been taken, and there are still many to be heard from. The following program has been arranged for the entertainment of the visiting tourists:

Friday Evening, July 9—7:30, Hotel Pontchartrain, banquet to the A. A. A. officials and directors.

Saturday, July 10—From 9 to 12 a. m., automobile manufacturers receptions at the factories.  
From 1 to 3 p. m., street parade of decorated automobiles.  
From 3 to 4:30 p. m., ball games and athletic sports at Belle Isle Athletic Grounds.  
4:30 p. m., entertainment to the Executive Board of the A. A. A. by the Automobile Club of Detroit.  
7:30 to 9:30 p. m., band concert on the campus in front of the City Hall.

Sunday, July 11—12 to 5:30 p. m., river excursion on the palace steamer, *City of Cleveland*, up the Detroit River, through Lake St. Clair and the Flats. Lunch served on board from 12:30 to 2:30.  
Sunday evening, rest.

Monday, July 12—Tour starts with demonstration, bands, military salutes, etc.



A. Y. Bartholomew in the Glide Entry, No. 14

### ONE MAN'S OPINION OF THE TOUR

By H. O. SMITH, CHAIRMAN A. M. C. M. A.

With more than forty cars entered in the Glidden tour, America's automobile touring classic, it is evident that this great annual event, which means so much to the industry at large, is more popular than ever. Vague and unfounded rumors have tried to impress upon the public that the Glidden tour was not wanted by the manufacturers and the automobile purchasing public. The large list of entries fully demonstrates that the makers thoroughly believe in this great event.

It is my desire to see this year the best Glidden that has ever been held. There is no question in the minds of those who have closely followed this tour that it has done more for the automobile industry than any racing or touring event which has ever been held in America.

The Glidden has worked wonders for the industry and pastime. It has shown the makers the good and bad points in their cars. It has given the makers the opportunity to try out the cars and locate the strong and weak points with the view of perfecting them. One may say that the maker can take his car on the road, put it through all kinds of stunts, climb steep hills, make it wallow through deep sand and over bad roads, and learn just what the car is capable of doing. To a certain extent this is true, but running under schedule and strict regulations means more to the maker than could be learned in private tests.

I know of many concerns that have entered the Glidden with what they supposed was a perfect car, and when the tour was finished opened their eyes in wonderment at little things which were supposed to be strong details but turned out to be weak. I have in mind one concern that had widely advertised the superiority of their braking system, and thoroughly believed that the brakes were right, but in going over a section of hilly country in the tour two years ago, every member of the crew was standing on the running boards ready to jump if the brakes

gave way. To-day this concern is making good brakes, and brakes that would hold the car on the roof of a house. There are many other similar lessons to be drawn from the Glidden.

The buying public demand the Glidden, and watch with keen interest the result and the progress of the cars during the event. They feel safe in buying a car that goes through the tour with a perfect score, or even with a good showing.

It is interesting to compare the list of entries in this year's event. For the first time in its history a buggy type car has been entered in the McIntyre. This little car will be closely watched by those interested in this type. Interest will also center on the wonderful little \$500 Brush with one cylinder. Other cars which will be the cynosure of all are the Marmon, Premier, Maxwell, Glide, Midland, Stoddard-Dayton, Moline, American Simplex, Rapid Truck, and others.

### HOW MINNEAPOLIS WILL ENTERTAIN

MINNEAPOLIS, July 6—The citizens of Minneapolis, headed by the Minneapolis Automobile Club, have raised a fund of several thousand dollars and appointed a committee of entertainment, headed by Col. F. M. Joyce, president of the State Association, to give the tourists a large time. It will astonish some Eastern motorists to learn that the Minnesota A. A. A. is now the second largest State organization in the country.

One of the features illustrative of the thoroughness with which details are being executed is found in the fact that the club has ordered 400 gold and enamel cap badges, one to be presented to each of the participants in the tour and is also having printed a beautiful souvenir book of views of Minneapolis for distribution, each book properly addressed and stamped ready for mailing to home of each recipient, after its inspection. The program will be as follows:

Friday, July 16—Reception of tourists and escort to hotels.

Saturday, July 17—Forenoon: Trip in chartered trolley cars to Minnehaha Falls and Fort Snelling, where a special dress parade and guard mount will be held.

Afternoon: Special train for Savage, Minn., where a special matinee race will be held between Dan Patch and Minor Helr, the two fastest horses in the world, at the home of these champions, the International Stock Food Farm.

Evening, 8 p. m.: Illuminated automobile parade for the visitors through the city and over the parkways and boulevards. Governor Johnson, Charles J. Glidden and Frank B. Hower will act as judges to award the prizes to the contestants in the parade.

Sunday, July 18—9 a. m.: Automobile trip to Lake Minnetonka.

10 a. m.: Cruise around upper and lower lakes in chartered steamers.

1 p. m.: Dinner at Tonka Bay Hotel.

2 p. m.: Automobile trip through the country near Lake Minnetonka.

4 p. m.: Automobile Country Club, where buffet lunch will be served and a band concert by the Fort Snelling band enjoyed.

Monday, July 19—Escort by club members of the tourists on the road to Mankato.

### PIERCEITES ARE FROM VARIOUS CITIES

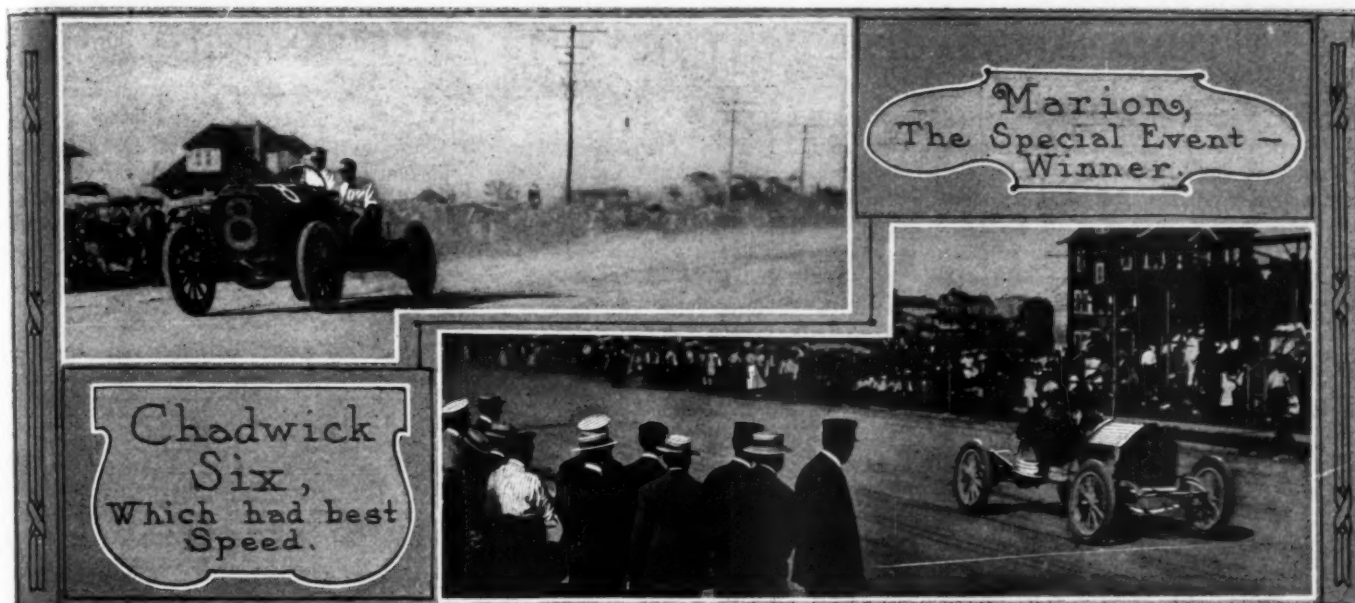
BUFFALO, July 6—Although the Pierce-Arrow Motor Car Company, of Buffalo, never has maintained a team of professional drivers for contests it has been uniformly successful in endurance runs. It would be hard to find a group of men with more widely segregated homes, in fact, than the eight who will have the Pierce-Arrows in charge in the Glidden tour this year. No two of them come from the same city. Some have had experience in A. A. A. tours before, others have not, but all are thoroughly impregnated with enthusiasm for the contest.

Two six-cylinder, 48-horsepower Pierce-Arrow touring cars will compete for the Glidden trophy. Forbes S. Dey, of Kansas City, will drive one, with E. M. Grady, of Denver, as his mechanic; while Walter F. Winchester, of Buffalo, will pilot the other, with A. A. Ledermann, of Utica, as mechanic. For the Hower trophy, two six-cylinder, 36-horsepower runabouts have been entered, the first to be driven by John S. Williams, of New York, with Andrew J. Hettrick, of Philadelphia, as mechanic. Charles Schofield, of Detroit, will be at the wheel of the second runabout and Frank Jungjohann, of Davenport, Iowa, will be in the mechanic's seat.



The McIntyre is a High Wheel Entry from Indiana





## CHADWICK SETS NEW RECORD IN WILDWOOD MEET

WILDWOOD, N. J., July 5—Independence Day was fittingly celebrated at this resort to-day in its most successful automobile carnival. Not only were there well entered handicap events, a large attendance, and a well policed course, but there was also that charm of an automobile race meet—breaking of fast records. To the Great Chadwick Six stock car, driven by Len Zengle, belongs the honor of the day in clipping more than a good second from the best previous time over a mile straight-away on Central avenue. In a special event, the climax of a series of good ones, this car flew down the gravel course in 41 seconds, a speed of 87.8 miles per hour, and well within the time set last year by Schill, of :42 3-5.

There were eight regularly scheduled contests for the afternoon, but these were increased by the fullness of the field and the consequent necessity of running heats. Then in the special time trials each of the six machines were given two attempts, and so the enthusiasm of the 10,000 people who lined the course was kept at a high pitch. Under the direction of Fred J. Wagner the cars were started, and the arrangements for the meet were so well handled that there were no tiresome intermissions, there was no friction between the participants, and the event has well been called the most successful ever held here.

A very important feature of the contest was that the machines were all of the stock class, many stripped of course, but there were no special racers, and the popular interest seemed to be increased thereby. The Chadwick and the two Knox cars were the victors in practically every event, but they had some speedy runners-up, and there were no walk-overs. Of the dozen times that the cars covered the distance in competition, the Knox team won five, the Chadwick three, the Marion two, an Allen-Kingston one, and one was a tie between a Knox and the Marion. Many trips were made in less than the minute, and it was sometimes necessary for the drivers to shut off their power before finishing even then. The track was in splendid condition and the finishing end had been improved so that there was less danger in stopping. Handicapping was carried out by price, there being a second for each \$200 difference, and the contestants were started off with the time allowance so that the finishes were true. This method may not always be as satisfactory or accurate as piston displacement ratings, but it furnishes good sport, and that was the chief aim to-day.

The police of the island were ably assisted by the Ninth company of the Boys' Brigade of Philadelphia, who were in their khaki uniforms and carried regulation rifles. They kept the

crowds back as well as the most efficient regular infantry. The referee was W. Clive Crosby, and the judges were H. U. Sharpe, H. A. Bonnell, and C. A. Woolson. The summary:

### TIME TRIALS OVER THE ONE-MILE COURSE, TWO TRIALS TO EACH ENTRANT

Pos.	Car	H.P.	Driver	Time
1	Chadwick .....	60	Len Zengle .....	:44
2	Allen-Kingston .....	48	Hugh Hughes .....	:48 4-5
3	Knox .....	48	Al. Dennison .....	:49
4	Knox .....	38	W. A. Bourque .....	:50
5	Marion.....	32-35	Charles Stutz .....	:49
6	Knox .....	38	J. V. W. Westervelt ...	1:06
				:52
				:53
				1:01 3-5
				1:04
				1:06
				1:07

### SPECIAL TRIAL FOR TRACK RECORD

1	Chadwick .....	60	Len Zengle .....	:41
	Best previous time.....			:42 3-5

### KILOMETER TRIALS

1	Chadwick .....	60	Len Zengle .....	:26
2	Knox .....	48	Al. Dennison .....	:28
3	Knox .....	38	W. A. Bourque .....	:31 1-5
4	Bulck .....	30	E. Wilkie .....	:32
5	Marion .....	32-35	Charles Stutz .....	:37

### FREE-FOR-ALL

1	Chadwick .....	60	Len Zengle .....	:48 2-5
2	Knox .....	48	Al. Dennison .....	
3	Knox .....	38	W. A. Bourque.....	

### GASOLINE CARS, HANDICAPPED ACCORDING TO REPUTATION OF CAR AND DRIVER

1	Marion .....	32-35	Charles Stutz .....	1:11 2-5
2	Knox .....	48	Al. Dennison .....	1:16 1-5
3	Knox .....	38	W. A. Bourque .....	1:16 2-5

### HANDICAP, GASOLINE CARS, ONE SECOND FOR EACH \$200 IN VALUE

1	Knox .....	48	Al. Dennison .....	1:08
2	Atlas .....		Elmer Knox .....	
3	Marion .....	32-35	Charles Stutz .....	

### HANDICAP, GASOLINE CARS COSTING FROM \$850 TO \$2,000; ONE SECOND FOR EACH \$200 IN VALUE

1	Marion .....	32-35	Charles Stutz .....	1:14 2-5
2	Bulck .....	30	E. Wilkie .....	
3	Overland .....	28	George L. Ries .....	
4	Mitchell .....	30	W. M. Cram .....	

### HANDICAP, GASOLINE CARS COSTING FROM \$2,000 TO \$3,000; ONE SECOND FOR EACH \$200 IN VALUE

1	Knox .....	38	W. A. Bourque .....	1:00 1-8
2	Chalmers-Detroit .....	40	C. J. Rodgers .....	
3	Knox .....	38	J. V. W. Westervelt....	

### HANDICAP, GASOLINE CARS COSTING FROM \$3,000 TO \$4,000; ONE SECOND FOR EACH \$200 IN VALUE

1	Allen-Kingston .....	48	Hugh Hughes .....	:58
2	Knox .....	48	Al. Dennison .....	

## INDIANAPOLIS SPEEDWAY GETS ITS FIRST SANCTION

INDIANAPOLIS, Ind., July 5—After many months of preparation the Indianapolis speedway has been so nearly completed that the director of contests, E. A. Moross, has secured a sanction from the Americal Automobile Association for the first race meet. On August 19, 20, and 21 the circuit will be the scene of the fastest races ever held in this country, and ones which will compare favorably with those on the Brooklands track in England.

According to the plans already outlined, the first day will be given over to events for the big cars at short distances, a sort of warming-up process, with record trials from one to ten miles. These will be followed by a long distance event, 250 miles, for the most valuable trophy ever given to cars whose cylinder displacement is between 230 and 300 cubic inches. The second day will have as a feature a contest of 300 miles, for cars measuring between 301 and 450 cubic inches displacement, for the Prest-O-Lite trophy. There will also be semi-final heats of the first day's free-for-all contests. As a climax the third day, Saturday, will see the finals for the free-for-all racing machines, a free-for-all handicap, and a great classic for which Wheeler & Schebler have donated a \$7,500 trophy. The race will be 350 miles long, and for cars whose cylinder capacity is from 451 to 600 cubic inches, including all of the famous racers in this country or Europe.

Mr. Moross has been assured of entries from many quarters, some of which will be a surprise to the automobile industry. Such, for instance, is the statement by Henry Ford that he will rebuild his six-cylinder "999," and that it will be driven by Frank Kulick. Those makers who have been entering the recent important contests will undoubtedly be present. The trophies and prizes for this series will be the most expensive given for such an event, the value being about \$10,000.

The big track is nearly finished. The top layer of gravel is

now upon the straight stretches, and a concrete mixer has been requisitioned to mix the gravel and oil which will be rolled as the final dressing. The main grand stand and the smaller private ones are having their roofs made and will soon be completed. The pits are being constructed at present and there seems to be nothing that could be thought of left undone.

### COLUMBUS HAS FAST TRACK MEET

COLUMBUS, O., July 3—Featured by a race of 100 miles, in which the world's record was very nearly broken, two days of automobile racing were conducted by the Columbus Automobile Club yesterday and to-day. The scene of the meeting was the local driving park, a one-mile circular track, which was in fine condition, and some very fast work was done by the professionals. In the big contest there were five starters: Lorimer and Cannon in Chalmers-Detroits, and Burman, Strang and De Witt in Buicks. Burman and Strang were the only finishers, and the time for the former was 1:44.

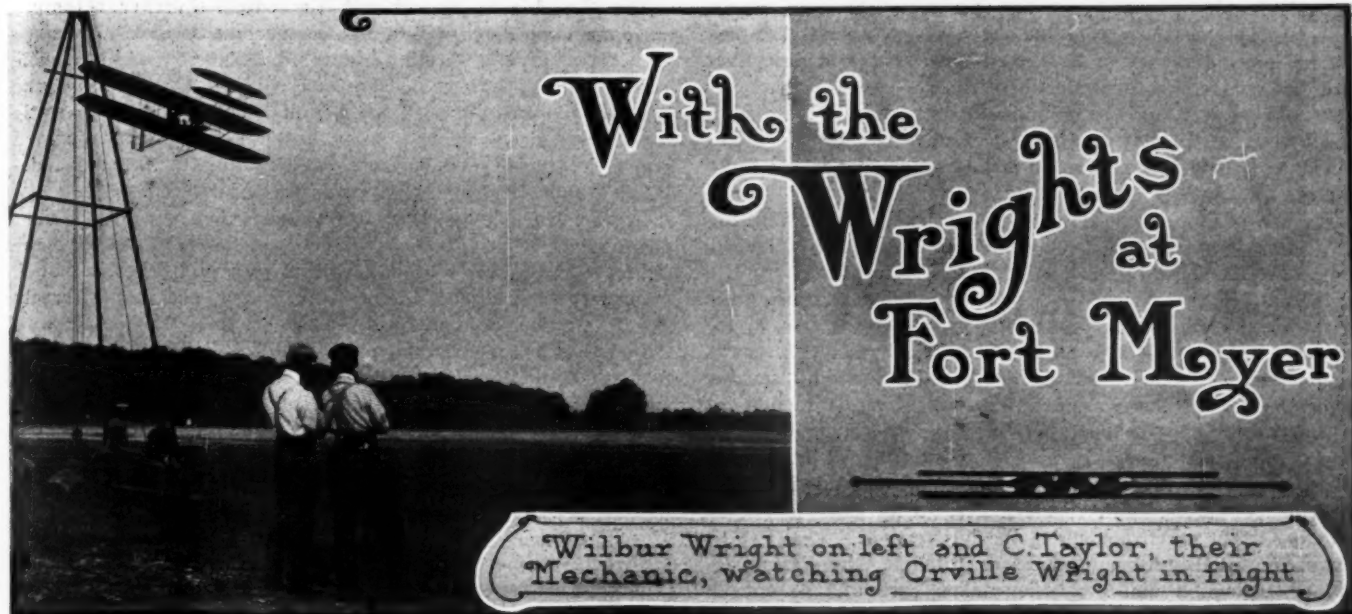
Perhaps the most interesting short events of the meet were the 25 miles, free-for-all, and 10 miles for the city championship. The former was won handily by Lorimer in a Chalmers-Detroit *Bluebird*, in :26 2-5, with Burman second. Barney Oldfield had his new National in this event, but had to stop because of tire trouble. In the city championship class only residents of this city and vicinity were eligible, and the race was won by a Packard, driven by Lawrence Kelly, in 11:21, with George Schlereth second, in a Pope-Hartford. There were no serious accidents.

Barney Oldfield tried to take a fall out of De Palma's one-mile record, and of Chevrolet's at five miles. His time in his new National was 4:43 1-5, which is 2 1-5 seconds more than the five-mile record, and his best mile was the last, 54 seconds, three more than the mark held by De Palma.



Bird's Eye View of the Indianapolis Motor Speedway Which Will Be Completed July 15, and Formally Opened August 19-21





Wilbur Wright on left and C. Taylor, their Mechanic, watching Orville Wright in flight

WASHINGTON, D. C., July 3—During the week of June 28-July 3, Orville Wright gave three successful demonstrations at Fort Myer, preliminary tuning up flights in preparation for the tests which the machine will have to pass before being accepted for the Signal Corps for the Government.

The first few attempts were failures, inasmuch as the aeroplane barely succeeded in getting off the track, and in remaining in the air but a few seconds of time, coming to earth in five different trials within short distances of the end of the starting rail. In none of these trials did the time in the air exceed thirty seconds, nor the distance three hundred yards.

Orville and Wilbur had different ideas about the cause of the trouble, Orville claiming lack of power, and Wilbur improper distribution of weight. With each successive flight, more and more power was obtained from the engine by alteration of the position of the spark and amount of gasoline feeding to the intake pipe. The Wright engine uses no carbureter, but takes gasoline directly into the intake pipe for vaporization there. Inasmuch as the minimum speed is thirty miles, and the maximum but little over forty, the Wrights believe that speed regulation, if dependent on a carbureter, would be obtained at too great a cost of unreliability and carbureter troubles.

The first successful flight came Wednesday evening, when the machine got up in the air and flew. It lacked both the lightness and ease it had last year, and appeared to labor, an impression doubtless conveyed by the steep angle which the planes had with the air. The speed, as a result of this angle—or, perhaps it is better to say, the low speed which caused this angle—was not more than 32 or 33 miles an hour during the Wednesday flights.

Thursday a short flight showed some improvement, and Friday saw the machine flying as the last year's model did—lightly, easily, with no wavering or hesitation in the air, and climbing at once and with apparent ease to an elevation of 75 feet, which was always the favorite height for Orville's flights.

**Disastrous Ending to First Good Flight**—The most successful flight, however, was to end in disaster. In the ninth round of the second flight of July 2 the engine either stopped in the air from an unknown cause, or was stopped by Orville in an endeavor to imitate his brother's spectacular feats in France, when, at heights of over a hundred feet, he would stop his motor and glide safely to earth. The doubt in the case is a contradiction in statements. Immediately after this glide to earth, Orville said the engine had stopped, a statement colored favorably by the fact that it had been missing almost continuously during the flights. Wilbur, on the contrary, said that Orville had stopped the engine on purpose. However that may be, at a spot almost over that on which the fatal fall of 1908

occurred, the engine stopped, the propellers ceased to revolve, and the machine made a beautiful glide to earth.

Unfortunately, Orville mistook a tree, some six or eight feet high—scarcely more than a bush—for a low clump of weeds. Too late he saw what it was on which he was to land, and too late tried to avoid it. It was struck by the extreme edge of the lower right hand plane, which was punctured by it. The tree immediately became a pivot, and the machine a compass. The forward motion was translated to movement in the arc of a circle which literally scraped the skids or landing runners from the machine. Had it not been for the tree, the glide down with motor stopped would undoubtedly have been successful. Orville said that, so far from being injured, he did not even feel the jar of the fall. As nearly as could be estimated, the glide down began at a height of 75 feet and carried him 500 feet, or at an angle of about one in seven. If Orville had any nervousness from his experience of last year it must have been dispelled from the way in which the machine behaved in thus becoming a glider. The glide down was upon an absolutely even keel and seemed under full control of the operator.

During the preliminaries and the performances of these different flights a feature of considerable interest that disclosed itself was the utter ignorance of the average person concerning even the most elementary principles of aerial navigation. Despite all that has been said and written on the subject, and the numerous successful flights that have been made, not one man in a thousand seems able to express a well-informed opinion on aeronautical prospects, or to impart a clear idea of aeroplane mechanism to friends. Even among the trained newspaper men frequent amusement would be afforded by the vagaries of an occasional rustic newsgatherer, who would insist upon interrupting efforts to give real information from the close-mouthed but good-natured Wright brothers with fool questions concerning the obvious—"Is that tall thing really the radiator, Mr. Wright?" or by dissertations on their positive understanding that the engine was formerly a two-cycle, or that, "anyway, last year a two-cycle motor was surely used."

**Lack of General Information Very Apparent**—General information on the subject of modern aeronautics having thus lagged so far behind actual accomplishment, a few words concerning the more fundamental principles involved can hardly be amiss, even though they be given at the risk of boring such readers as are no longer in the A B C class.

The design of the Wright aeroplane, in common with those of all others of their general type, such as the Farman, Voisin, Antoinette, Bleriot, Curtiss, etc., is fundamentally based on the very simple principle that inclined surfaces, moved rapidly

through the air in an approximately horizontal direction, receive considerable support from the deflected streams of air that their angular placing causes to be forced down under them. Even with flat surfaces considerable lifts can be obtained, but with properly curved surfaces, approximating the form of the soaring bird's wing, sustentations of from two to five pounds per square foot of surface are readily to be had at speeds not in excess of 40 miles an hour.

The speed required for the requisite lifting effect demands that a flying machine of the aeroplane type be run on the ground at its slowest flying speed before it can begin to lift. In the case of the Wright machine, this initial impulse is given by towing the vehicle along at a rapidly accelerating rate, by the pull of a cable attached by a simple pulley system to a heavy, trigger-released weight that is dropped in a small "starting tower." Once in the air the horizontal travel is maintained by the thrust of two oppositely-rotating, two-bladed wooden propellers, which are said to develop a thrust of 80 pounds apiece, and which are driven by roller chain transmission from an ordinary water-cooled, four-cylinder, 30 hp gasoline engine, weighing about seven pounds to the horsepower.

**Problem of Equilibrium a More Difficult One**—The matters of sustentation and propulsion taken care of, the considerably more complex and difficult problems of maintaining equilibrium remain to be considered. These problems reduce themselves primarily to questions of lateral and of longitudinal equilibrium. In the Wright machine, the lateral equilibrium is controlled by a single lever by the manipulation of which the wing extremities can be "warped"—that is, twisted up on one side and down on the other, or vice versa.

Steering as well as side balancing is accomplished through the wing warping, but since the wing extremities of steepest angle receive the greatest resistance as well as affording greatest lift, they tend to lag back instead of going faster, as is necessary in turning. Therefore, not primarily to steer, but simply to resist this tendency, a rear "rudder" is provided. In the Wright machine at Fort Myer this is controlled by a third lever, but in the machine used by Wilbur Wright abroad it is operated by the wing-warping lever, which is given a compound movement that it may serve the double purpose.

Obviously, the natural and most simple type of sustaining surface is the monosurface of the bird, but the difficulty of making this strong enough without exceeding the weight limit in a man-made contrivance causes the bi-plane to present a marked advantage, which is that it lends itself perfectly to a very strong and light, bridge-like, truss construction. And, with the superimposed surfaces separated a distance bearing a proper relation to the width of the surfaces, the action of one in reducing the lifting of the other is present to an immaterial extent.

**This Machine Very Different from Its Prototypes**—The present machine at Fort Myer has the same motor that was used last year, but otherwise is entirely new, and differs from its predecessors in a number of essential particulars. Instead of 40x6½ ft., for example, the main surfaces are now about 36x6 ft., with other dimensions reduced in proportion. One result of this change is a reduction in total area from some 580 ft. to about 490 ft., requiring, since the reduced machine has been increased in strength by not being lightened in weight, a lifting effect of 2.2-5 lbs. against the 2 lbs. per sq. ft. of the previous model. This, in turn, requires from two to three miles an hour more speed for a given sustentation, but does not call for quite a proportionate increase in power, because the head and aerodynamic resistances are lessened by the smaller sizes. Nevertheless, in the first of the present trials certain differences were very evident to the close observer. First, there was the inability to get into the air at all at a flying speed until the motor was speeded up and the starting rail lengthened, despite attempts to secure results through a redistribution of weight.

From the action of the aeroplane during these preliminary flights, when it seemed to rear up in the air and thus diminish its speed before it was fairly launched, Wilbur got the idea that the forward planes were too light.

**The Trouble Is Found and Remedied**—Further attempts were made with less weight, and the machine behaved very much as before. Finally, Orville discovered that much of his trouble was due to a defective sparking mechanism, which allowed the spark to jar back almost to zero in flight, of course thus greatly diminishing the power of the engine. Further attempts proved him right, as the next day, with spark adjusted, the engine developed enough power to make a successful flight.

In the first flights that were made the machine, besides progressing at an unduly uptilted angle, seemed to lack the lightness and speed of its larger prototypes, and flew "as though it burdened the air," as one observer put it, and seemed barely able to stay up. In coming down the brunt of the contact with the ground is taken by the runner-like alighting gear. This feature of the machine also has undergone modification, the runners being now much higher than before, so as to reduce the chances of injury to the lower wing surfaces from the machine careening over in landing.

Particularly impressive are the landings, which seem quite without measurable hazard, even to the most critical. Approaching the ground at a very flat angle, the first evidence of the machine's closeness to it is the dust blown up by the propellers. Then as the runners make contact, almost as lightly as feathers, and the power is shut off, the machine quickly is retarded to a stop by the braking effect of the runners.

**Difference in Flight of Two Machines Very Noticeable**—Last year the invariable comment of every one who saw the machine was, "How easily it flies." Those who knew an aeroplane from an ice wagon were wont to remark upon the flatness of the angle of the planes when in the air. The difference was thus greatly marked when, in this year's flights, the machine barely dragged itself aloft and stayed there with effort.

Immediately after the unfortunate accident at the end of the glide, Orville said: "I am sorry it had to occur now, because it means delay just when the engine and the aeroplane were getting right." This is true, since the last flight before the accident showed that no mistake had been made in altering the dimensions of last year's successful machine, and that it was getting thoroughly tuned up ready to make the tests.

These tests are exhaustive and stringent. The first is a speed test. After some cogitation and exploration, the Wright brothers selected the so-called Alexandria, Va., course for this trial. The machine will get in the air, get up speed, and cross a line on the parade ground, fly five miles over rough and open country to Alexandria, Va., where it will round a small balloon and return to the fort. Time will be allowed for the turn and counted only on the straightaway, the idea being to determine the speed at which the machine flies. The price paid will depend on this speed. For 40 miles an hour the Wrights will receive the tidy sum of \$25,000 for the aeroplane. For every mile in excess of this speed, up to and including 44 miles an hour they will receive 10 per cent of this amount additional. For every mile less than this amount per hour, 10 per cent of \$25,000 will be deducted from the purchase price, down to and including 36 miles per hour. Less than this speed will not be accepted by the Signal Board.

The speed test must be made with a passenger on board and enough gasoline at the start to carry the machine 125 miles.

The second test is an endurance test, and must be made also with a passenger and gasoline for 125 miles. During this test the aeroplane must remain continuously for one hour in the air, during which time it must be demonstrated to be under full control, and make such evolutions in the air, right and left turns, etc., as show this to be a fact.

Further than this, the Wrights must instruct two officers in the art of aeroplane manipulation until they can fly successfully.

The lieutenants who will receive instructions are Lieut. Frank P. Lahm, in charge of the aeronautical corps, and Lieut. Benjamin D. Foulois, of that branch of the service. Lieut. Lahm is an experienced balloonist, and was the first man in America to be a Wright passenger. Lieut. Foulois is inexperienced in any but dirigible work, but an expert there.



# Functions and Frailties of Motor Cylinders

BY THOS. J. FAY

**C**ORE is the name of the part of a mould, as used in a foundry, by means of which the shape of the interior of a cylinder, or other form of castings, are made. Cores are made separate from the rest of the moulds, and inserted in them at the proper time; in "coring up" in a foundry, the cores are carefully placed in position, ready for the casting process; unless the cores are rightly set the result will be as shown in Fig. 5, and the walls of cylinder will be of varying thickness, due to misplaced core, which may follow bad centering or shifting during the process of "ramming."

If cores are not provided with adequate bearing, the result may be as shown in Fig. 6, resulting in a thin dome of the cylinder, and since the greatest pressure comes on the dome it is almost sure to fail in service. Accuracy of core making depends upon accuracy of the previous core-box work, and cylinder patterns that match up. Frequently in foundries that are accustomed to the demands of cylinder casting, which is far more exacting than in the ordinary run of work, defects come from inferior patterns; which defects may be due to lack of skill on the part of the pattern maker, or lack of good material in the pattern. True, a good pattern will last but a short time in the hands of foundrymen who fail to appreciate the delicacy of the task, and who throw the patterns around as if they were of almost no importance at all.

Selected grades of seasoned Mexican mahogany will serve very well for patterns, and the cost of the material is not high enough to warrant the use of inferior wood. Since cylinders are required in quantity, and the patterns are, as a rule, in continuous use, core boxes, of pattern pine, of the first grade, may serve extremely well, especially as they are not nearly so delicate as patterns, but, as before stated, it is of the greatest importance to have the cores and the patterns match up. In actual practice there is no better plan than to take the first cylinder, after a good looking one is run off, and saw it into quarters, in the longitudinal plane, and through the valve chambers, in the same way, after which it will be possible to measure the thicknesses of walls, although, as a rule, the eye will detect differences, at sight, after the cylinders are sawed in twain.

If the walls are not of substantially the same thickness at all points, it will be well to ascertain the reason, and if it is found that the cores are not central in the pattern, as fixed by core boxes, there is nothing remaining but to make the necessary adjustments. If the core prints are without sufficient bearing, or if they shift in the process of ramming, the corrective measures should be applied, and account should be taken of the thinness of walls used in cylinders; the factor of safety being barely sufficient if the walls in castings are as in drawings, which makes little or no allowance for defects in the foundry.

**Neat Match at Parting Line**—In view of the difficulty in reaching the inner surfaces of cylinders in the region of the valves, it is important to have the parting line come with a neat match. As a rule the parting comes at the top, in the bore, and unless the match is neat the seam, as shown in Fig. 7, will show around the bore, and pass along the walls of the ports, just at a point where it will be difficult, or impossible, to machine away the

protruding metal. Fins are very prone to heat to a point above the temperature of the rest of the material and pre-ignition will follow, especially if the compression is fairly high in the cylinders, or provided the cooling is inferior during operation.

The outline which separates the parts of a mould will only be neat if the foundryman is skilled—assuming patterns and core boxes do not warp—even when the pattern work is of a character above fair criticism, and while this is not a matter of great importance in ordinary casting work, it takes on extraordinary proportions in the process of casting cylinders, for the very reason that pre-ignition will follow if partings do not match, since the resulting fins cannot be removed if the space is restricted, and tools cannot be made to reach the line of parting at all points, which is usually the condition that obtains in cylinder castings. When castings are received at the plant where they are to be machined, it is a good practice to have them inspected at once, and if the workmanship is inferior a good inspector will be able to judge of the fact; to promptly advise the foundry of the condition obtaining is equal to saving must cost in the finishing process, since the foundry management will then be in a position to restrict the percentage of inferior work, and if conditions warrant patterns may be overhauled, with the expectation of correcting the defects, once and for all.

**Hydraulic Test Should Be Made**—If cylinders are so designed that a hydraulic test can be made before they are machined, the cost of finished product will be reduced, on the ground that "wasters" will fall by the wayside before any machine work is expended on them. This is a detail that is attended by some resistance, as a rule, due to the difficulty attending the application of hydraulic testing equipment to rough castings, since joints will only be tight against a sufficiently high pressure if they are well made. Generally it is necessary to do some facing off in order to make the flanges for the hydraulic piping as tight a fit as the occasion requires; that it will pay to do the necessary work to enable the hydraulic test to be made upon receipt of castings is one of the points to be made.

It is sometimes claimed that the test cannot be made before the castings are finished, on the ground that they may be tight against hydraulic pressure when the "skin" is on the inner walls of the castings; this is probably not true, for after machining the skin is on the outer wall, and if the cylinders are not then tight, it is proof of lack of virtue of the "skin."

The average foundryman depreciates all attempts at testing that are made with a pressure above 50 to 60 lbs. per sq. in.; that this pressure is adequate for the purpose is highly improbable, and that 500 lbs. per sq. in., hydraulic pressure, will develop every defect is one of the matters that can be taken for granted.

For the purpose of making tests, by hydraulic means, high-pressure equipment, adapted for testing steam boilers, serves, and the cost of the pump and gauges, as well as tight-joint fittings, is so low as not to be a factor; less than \$100 will cover the whole item of cost. Ammonia fittings, in which a system of packing is used, work very well for the purpose, and

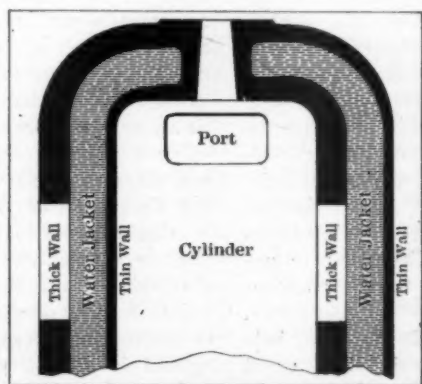


Fig. 5—Misplaced core, resulting in thin cylinder walls

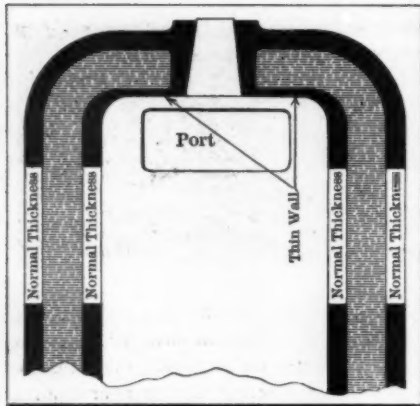


Fig. 6—Displaced core, resulting in thin dome of the combustion chamber

they do not shoot a "geyser" at 100 pounds per square inch pressure, they will serve very well, even if a little fine spray does develop at the higher range of pressures; if the pressure is left on for a time, provided the spray does not advance to the dignity of a stream, there will be no advantage in continuing the test. That a second "inspection" test should be made on the finished cylinders is one of the matters that would seem to fall within the pale of good practice, particularly in view of the importance of cylinders in motors, and the labor item involved in changing them if they show defects in service.

**Defects That Do Not Always Develop**—Slag, which is the dross or recrement from metal, while it is cleared from the top of the molten mass in the cupola, for the most part will betimes entrain, and when it settles in the section of the casting the defect may be deep enough as not to uncover. Cinder, which comes from a cinder bed, if the same is used in the process of venting will, at the behest of a workman of careless proclivities, settle in the casting and may come to the surface in the process of machining, as shown in Fig. 8, so that slag and cinder, whether they uncover or not, will weaken the metal in proportion as they are present; slag, especially, is likely to abound, and in the castings that carry this increment, the strength is much reduced, thus rendering the same unfit for cylinder castings. If slag or cinder pockets uncover, the bore of the cylinder, in such a case, will show the defect, although it may not be fatal; this is a matter that has to be treated by makers of cars when they decide on the quality of the product they propose to deliver to patrons; some makers will prefer to ignore the presence of surface blemishes, if they do not come in a vital spot in the castings.

**Shrinkage Defects Are Prone to Creep In**—If a bunch of metal is allowed to accumulate at a point in the section of an

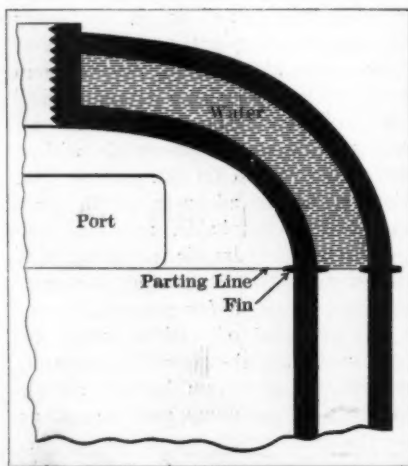


Fig. 7—Fin, at parting line, the product of warped patterns or inferior moulding

they have the virtue of being quickly taken apart; they can also be tightened under pressure, and to draw them up until they are tight is a very simple matter that can be entrusted to a workman of no great skill. In the absence of good and tight fittings it is impossible to make a satisfactory test, since the pressure will fall down within a few seconds of time. In testing cylinders, if

gate of the mould, is usually made to include a "waste piece," to which the sillage will float, and metal will draw from this excess to render the casting solid. In this is an illustration of the point to be made, and in Fig. 9 a boss is shown, the section of which is so great, relative to the main section, that a shrink hole becomes a normal expectation. In the same way a shrink hole will be found in the "lug" that projects like an ear from the bottom flanging, to take the holding-down bolts of the cylinders; if this lug is massive it will have a shrink hole in its section, as depicted in Fig. 10, and the strength of the lug will be reduced very much.

As another example of shrink holes, due to the use of fillet work, that is wholly unnecessary, in that the radius of the fillets does not have to be so great, Fig. 11 is offered, in which it will be observed that the shrink hole comes at the junction of the water jacket with the cylinder. This is bad enough, but it is no whit of the difficulty that follows when the shrink hole comes in the junctions of walls of the valve ports, thus offering opportunity for the combustion pressure to leak through into the water jacket, and for water to flood the cylinder on the suction stroke, when the pressure within the cylinder is below atmosphere.

#### Difficulty Attends Casting Work for Air-Cooled Cylinders

—In the pioneer days of the industry, when air-cooled cylinder work was undertaken

by foundries of no experience in this line, it was found that nearly all the cylinders were defective, as shown in Fig. 12, owing to the laws of shrinkage, the bunching of metal, due to the presence of ribs or flanges. In one instance the author procured 54 cylinders from a foundry before enough modifications were made to enable the foundry to



Fig. 8—Cinder pocket, due to careless foundry work for the most part

cast good work. In this undertaking the design was, on a par with current practice, and the foundry was accustomed to do good cylinder work, with many hundreds of fine examples to be seen in cars that made a fair record. Despite the favorable circumstances it was found that the castings were defective in every case until after the number of cylinders, as above enumerated, were poured, and as the problem became better understood the results improved, until finally the castings were run off on a better basis, more nearly free from defects.

Nearly all the defects showed up in the bore of finished cylinders, and in the above example, they were so numerous that it was not possible to consider their use. Even the best cylinders, made of the class in which flanges are integral, do not show a perfectly uniform surface structure, nor is it likely that cylinders, with the ribs cast integral, will ever be as uniform in structure, over the surface of the bore, as will follow in the class of work that includes a uniform thickness of cylinder walls, and other characteristics to match.

Some makers of air-cooled motors, to get away from this, and other casting troubles, follow the practice of applying cooling flanges, after the cylinders are machined in and outside. In this way air-cooled cylinders become very efficient for the purpose, particularly if the flanges are applied so tightly that the joint between them and the cylinder wall is good, from the point of view of the transfer of heat. True, no joint will be as efficient as integral metal; equally true, more flanges can be applied than may be cast integral; the result is that more surface, which is desirable, offsets the slight disadvantage, and this con-

otherwise symmetrical wall, shrinkage will follow, as a matter of course, and a shrink hole will appear in the section. Shrinkage represents the dimension lost by contraction in metal while cooling; the zone of slower cooling will hold the defect; the section of greatest dimensions will be defective under the circumstances. The sprue, which is the hole through which metal is teemed into the



struction has the property of assuring positively good cylinders and enough surface to afford an adequate measure of cooling.

**Good Cylinders Are Cast in the Vertical Position**—In the old days it was common to see cylinders cast in the horizontal position, with the result that the sillage settled in the barrel, on the top side, and many such cylinders were found to be too defective to sustain in service, thus accounting for the many cylinder failures in automobiles of the earliest time. This same problem was struggled with in the early days of water, and other cast-iron piping, until the practice of casting vertical, in the sand, was adopted; from that time cast-iron piping became a reliable reality. Likewise, in cylinder work, it was found that vertical casting gave the best results, and it is now the accepted practice to so cast them.

In this way, in view of the specific gravity of sillage, which

is below that of molten cast iron, the sillage floats to the top, and if a suitable sprue is provided, with gating properly done, all the sillage will be in the "waster" piece; if provision is not made to dispose of the scoria, or other contents that will fall short of quality in the finished casting, it is very prone to settle in the metal, in the region of the valve seats, as shown in Fig. 13; that the sillage will be largely in the surface metal is one of the points that follows logical deductions, and accords with experiences, from the very fact that the sillage is lighter than the body of metal, and is, by the heavier metal, displaced and floated to the surface. In some cases it is the practice to add double "finish" to the valve seats, rather

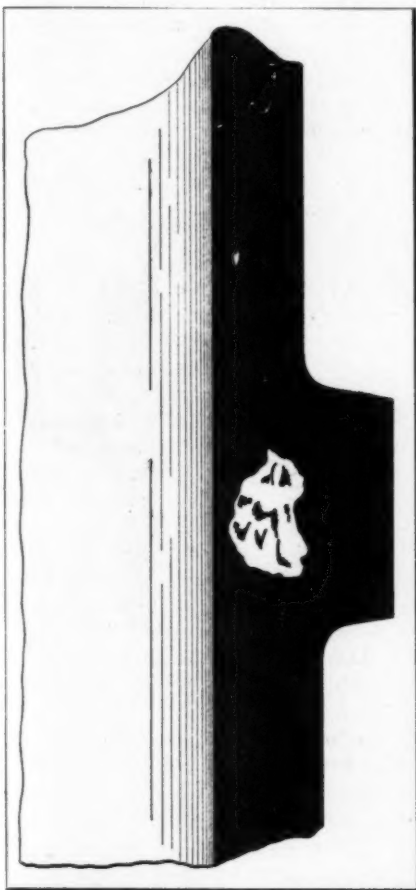


Fig. 9—Section at oil-boss indicating shrink hole due to presence of excess metal in boss

with the expectation that the defective surfaces will be machined away, although, as before stated, it is better to run high sprues and allow the sillage to gate away to a point where it will do no harm.

On account of the great importance of having very good metal in the valve seats, it is the practice in some schools of design to provide special metal in the seat, as shown in Fig. 14, by having the valve seat, and its casting, separate from the cylinder casting; with valves in the head, using individual valve housings, the advantage is on the same basis as in the case here shown, excepting that with valves in the head they must be of small diameter, because there is not room enough to make them as large as the standard of practice would seem to dictate. In standard work it is considered that the valves should be in diameter equal to half the diameter of the cylinder, if the speed of the piston is to be 1,000 ft. or over per minute. All valves are not made so large, for the reason that many designers consider that warping is the more prone to happen, and a leaky valve will do more damage, by way of reducing the per-

formance, than will follow if the passages are a little restricted, as they will be if the valves are smaller.

**Ill Effect of Excess Finish In the Bore**—Finish is indicated on working drawings by means of the (small) letter *f*, placed on the line, depicting the boundary of the casting, if it is to be machined on that boundary. In cylinder work, of the class used in automobile motors, it is not the practice to allow for re boring more than once, and the finish is also restricted to the least possible, as fixed by practical considerations, one of which is that the castings much finish up in the bore, because the bore must be free from imperfections. That the surface should be one that will wear well is also a consideration that cannot be overlooked, and in order to be sure of this point, it is the custom to take advantage of the superiority of surface metal, which is somewhat more dense and closer grain than the metal below the surface, as Fig. 15 indicates.

"Chill," while it is a property that is not wanted in castings that have to be machined, is nevertheless taken advantage of to a slight extent, since chill metal is quite as dense as some grades of steel. In the foundry, when it is desired to have the metal chill to a considerable depth, the proportions of the "charge" in the cupola are adjusted to afford just such results, and chill moulds are used to intensify the result; the moulds are faced with chills, that is to say, facings of iron are used, and since iron has a better heat conductivity than moulding sand, the heat is conducted away from the metal to be chilled, and the result is about the same as if the castings were to be quenched in a quenching bath, as is done to render steel as hard as its characteristics (which is dependent upon the carbon content of the steel) will allow of.

In cylinder work no chills are employed, because it is not desired to render the surface so hard

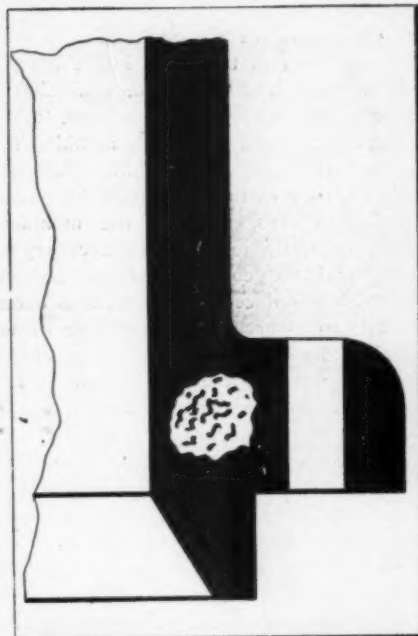


Fig. 10—Shrink hole in section of bolting lug, following presence of excess metal

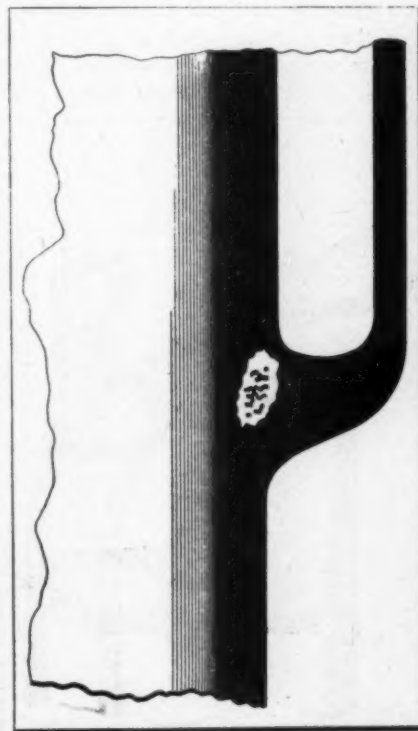


Fig. 11—Imperfection, at junction of water jacket, influenced by use of large fillets

that difficulty will be experienced in machining them; the charge in the cupola is so regulated that the metal in the bore, if excess finish is not allowed, will take on considerable degrees of hardness, under normal conditions, in regular moulds. The amount of finish that should be allowed depends, to a vast extent, upon the quality of the patterns, skill of the moulders, which naturally includes the accuracy of cores, and the core setting as well. If the finish is reduced to 1-16 in. it is barely possible to assure that the surface of the metal, under the finish, will be sufficiently hard to warrant the assumption that a slight chill surface will be present.

The difference between chill iron and the balance of the casting is the difference between gray and white cast iron in a gray iron casting. The gray product is soft and runs high in graphitic carbon, while the white iron is hard and partakes of the qualities of steel to some extent, due to the increased presence of combined carbon. The presence of chills in a mould, while they have the property of quickly cooling the metal as it contacts with the chills, will not result in the same depth of chill of all grades of pig iron, due, among other peculiarities, to alterations in the silicon content; if silicon is high the chill phenomenon will be reduced.

In cylinder casting work, in view of the main requirements, it is not desired to have the chill properties too prominent, and in order to have a facing of white iron over the gray iron core, it is necessary to fix the finish accordingly, which is merely a question of resisting the same, and making up for this restriction by doing fine work in the patterns, to begin with, and in the foundry for the rest.

**Quality of Cylinders Depends Upon Co-operation**—From what has been said it may be inferred that the quality that must reside in cylinder castings, if they are to excel, depends upon the co-operation of the pattern maker, the foundryman and the machine shop artisan. Each will be able to thwart the other in any attempt to evolve quality, but good foundry iron must be settled upon concurrent with the use of mahogany for patterns, and certain degrees of "horse sense" in the shop. No matter how competent the designer may be, if he is not supported in all departments, the purchaser of the car, and the shareholders of the maker will have to face loss.

From the point of view of the designer, in the process of evolving good cylinders, it is necessary to determine as to the compression that will afford the best results; then, the shape of the cylinder is important, in that the mean effective pressure will depend upon the shape, as well as upon the ratio of clearance to displacement volume.

That a perfectly symmetrical shape is of the greatest advantage is found to be true, and since it is desired to have the least possible surface between the combustion chamber and the cooling medium, a shape that will give the least surface should be selected. A semi-sphere affords the least surface, and is frequently selected for the dome of motor cylinders on that account.

Before going into this phase of the subject, however, it is important to point out that cylinders are made with integral heads, for the most part on account of the difficulty experienced in packing joints when they are in the great heat and expansion changes that are normal to automobiles. It has been found that no form of packing will stay tight for any length of time, and even when joints are "ground" they are prone to leak in the course of events. It must be remembered that the pressure is high—varies from below atmospheric to the maximum at a sharp rate—and is attended by rapid heat changes which accentuate the tendency. If the holding bolts are separated any considerable distance the castings are likely to deform enough to leak compression, and destroy the good working of the motor. In some cases it was found that long holding bolts would stretch enough to allow the head to raise off the cylinder and the compression would leak out in this way; this form of trouble was extremely difficult to detect, since the head would be perfectly tight with the cylinder cold, and the leakage would be momentary, due to expansion of the bolts from heat and pressure. In some examples of twin cylinders, with very thin walls between them, especially with soft and porous metal, leakage develops between the cylinders, and the greatest difficulty, due to this defect, lies in the transfer of the products of combustion from one cylinder to the other, thus destroying the advantage derived from complete scavenging. This trouble is avoided in some designs by having a gap between the cylinders, so that the walls are not common to both of them, and while the space required is increased, the plan has the advantage of absolutely defeating trouble of this sort.

Cylinders cast en bloc, to be used in motors of the class having crankshafts with but two bearings, must be as short as possible to favor the crankshaft, and in such cases it is the practice to make common use of the separating walls of the cylinders; in such cases, trouble is guarded against by the proper "venting" of the moulds, which is possible owing to the method of using separate covers for the water-jacket, thus affording good venting for the gases to escape, and assuring close metal with freedom from attending troubles of the character above named.

(To be Continued.)

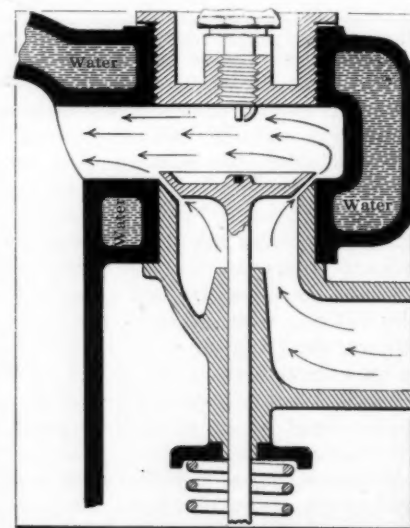


Fig. 14—Separate valve housings afford an opportunity to use superior metal in valve seats

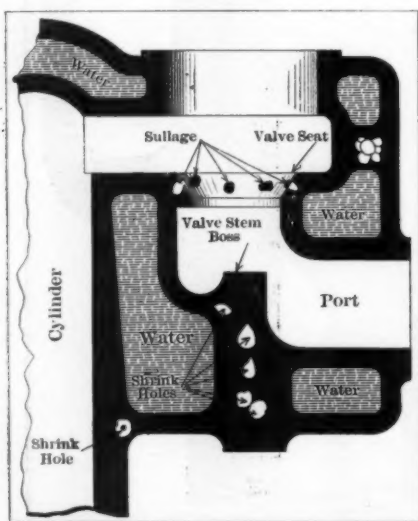


Fig. 13—Sullage renders valve-seats defective when the cylinders are cast vertical, and carelessly done



# A CONSTANT PRESSURE ENGINE

By Morris A. Hall

WHEN Brayton brought out his constant pressure engine in 1873, he did so at an unfortunate time, for just then the Otto cycle engine was beginning to come into its own. The simplicity of this, coupled with the additional complications of the Brayton engine, particularly noticeable in small powers such as were usual at that time, did much to discount the Philadelphian's invention, although theoretically it had much to commend it, and the machines built and operated then were unusually successful.

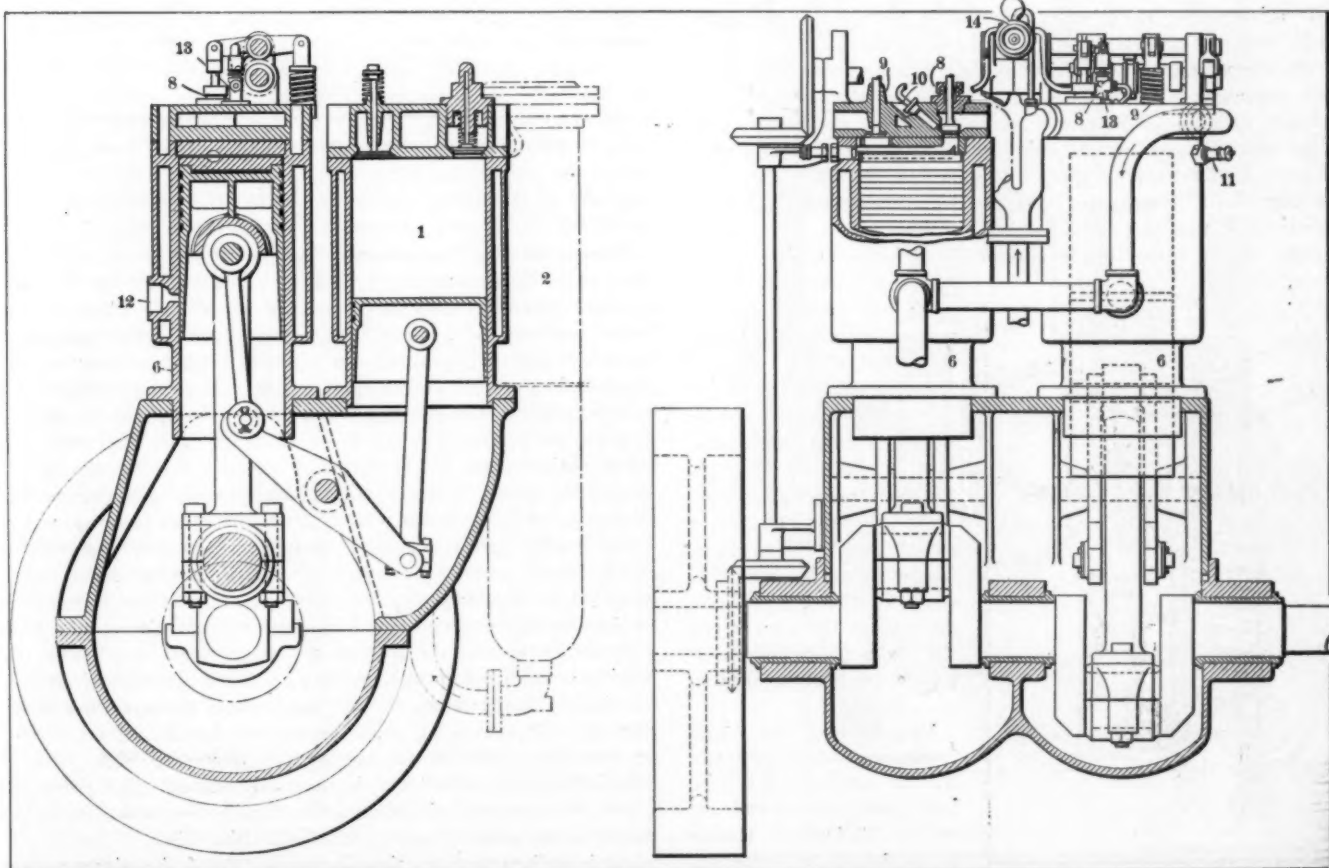
In as much as some work is being done now upon engines of the Brayton type, one having been brought out very recently, a short mention of the principle upon which the type works, and of the particular features which distinguish it from the ordinary gasoline engine, is well worth space.

First, as to the history, Brayton was a Philadelphian, who invented and constructed an engine in 1873. This was exhibited at the Centennial in 1876. The foreign rights to the invention were purchased by Messrs. Simon, of Nottingham, England, who constructed a machine along the same lines, but differing somewhat in detail. A Simon-Brayton engine was exhibited by the English firm at the Paris exhibition of 1878, and attracted much attention. The additions made by the Messrs. Simon were not very successful, in fact their engines did not perform as successfully as did the original. One year later, a German firm, Hennig & Company, brought out an engine of this type, under license from the Simons, but this also was not very successful, due to the fact that Germany had then taken up with the Otto form,

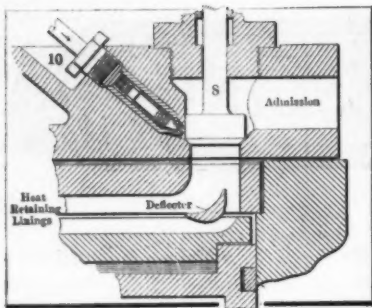
going in for it very extensively. So, the more complicated constant pressure machine could hardly get a hearing. Probably the last attempt of that period was made by a Scotchman, Foulis, of Glasgow, who brought out his motor in 1881, although his patent was dated some three years previous to this. Like its English and German prototypes, this was shortlived.

**Diesel Shows Some Similarity**—The German Diesel engine shows a marked similarity to these, in that it operates at a constant temperature and theoretically it comes in the same class. But Diesel introduces his fuel in the form of a spray, projected into a highly compressed mass of pure air, the temperature of the latter being such as to ignite the fuel instantly. The compression of the air is an adiabatic change, and the fuel is so sprayed in as to maintain a constant pressure. This continues up to the point of cut-off, whereupon a decrease in pressure with a corresponding rise in volume takes place, this being adiabatic expansion. It is said that this cycle does not approach the true Carnot heat cycle as closely as would an engine in which the operation proceeded along constant pressure lines rather than constant temperature. That is to say, that although the Diesel motor has up to date shown the greatest efficiency of any known internal combustion engine, its possibilities are far below that of the engine operating at constant volume. On the score of efficiency then, the Brayton may be considered as of a much higher type than the Diesel.

The working cycle of an engine of the Brayton type consists of five operations. These are:



Section and Elevation of Stiliz Constant Pressure Internal Combustion Engine



Detail of Admission Valve

All of these requirements are well within the range of the possible, but to carry out the cycle in an efficient manner a number of conditions will have to be fulfilled. Some of these are: there should be no throttling during admission of the charge to the pump; no heating of the charge as it enters the pump from the atmosphere; no loss of compression to the pump and receiver walls or within the latter; no throttling of the charge as it enters the motor cylinder from the receiver; no loss of heat by the flame to the sides of the motor cylinder and piston; no back pressure during the exhaust stroke, and the latter must be very complete, that is, the working cylinder should have no clearance. This last, however, is but a mechanical detail of construction, easily attained.

**Newest Constructor a Philadelphia Man, Too**—The newest constructor along the lines as laid down by Brayton thirty-five years ago, is also a Philadelphian, H. B. Stilz, by name. Stilz has built and operated several engines for widely differing purposes, having gone far enough in each case to prove his design a markedly successful one. The engine possesses a number of modifications over that of Brayton or any of his contemporaries, and all of these are by way of improvements tending to make the resulting product more efficient, in the light of thirty years progress.

In this engine, the compression being more or less isothermally that of cool air, is accomplished with less work (than in the Diesel type) and without any great temperature rise. The cool compressed air absorbs more than enough heat from the exhaust gases to balance the cooling loss in the compressing outfit and thus the engine gains by the difference in the work of cool and hot compression. This saving, though small, is in the nature of a recovery from the exhaust and therefore indirectly a source of power.

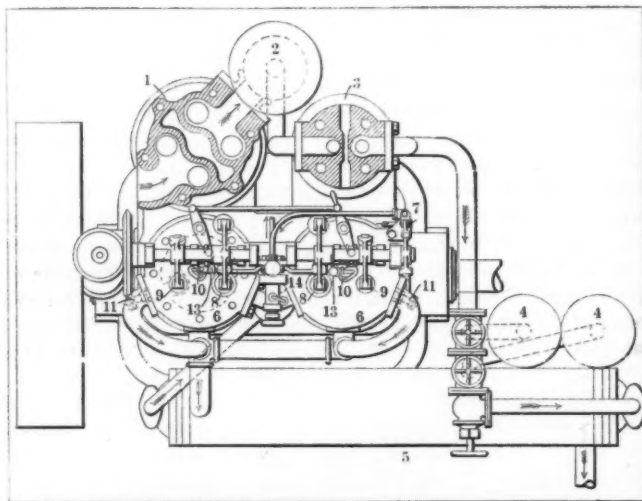
Stilz scores again in the compression, for a specific weight of air is a necessity, which with hot compression involves pumping a much greater volume at the same pressure, due to the natural expansion under heating and consequent loss of volume. This additional pumping means more power and is a direct loss. What heating or expansion may take place in the Stilz engine does so at the expense of the exhaust, a loss anyhow, so that no actual loss is sustained.

**Possibilities for Improvement**—It may readily be proven that the heat efficiency of any internal combustion engine is increased by compressing the working medium

with the least possible rise in temperature so as to make possible the greatest recovery of heat from the exhaust, and by securing complete combustion at a constant pressure. In so far as this presents in a concise form the points sought after by both the Brayton and Stilz designs, it is fair to say that the latter has but to prove that he obtains them, to secure the recognition awaiting a genius, who succeeded where others failed.

Only time and continued tests can prove these points but a description of the engine will show if the device is such as to bring them within the range of possibilities.

The engine shown is of a type suitable for automobile or marine use, but the first engine built by Stilz, and even now running successfully, was of a more substantial type intended for stationary use. This was somewhat larger than the one shown, having a single power cylinder  $5\frac{1}{2}$  inches in diameter by 7 1-2-inch stroke, single acting, but receiving an impulse every stroke, thus being comparable with a two-cycle engine. The low pressure cylinder was 4 1-8 inch by 6 inch working double acting and driven from the main shaft, this being like a two-cylinder crankshaft with cranks at 180 degrees. The high pressure cylinder was much smaller with a bore of 2 1-8 inch and



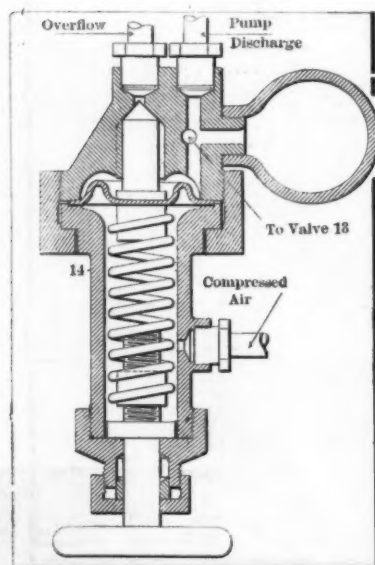
As Stilz Engine Appears from Above, Partly in Section

a stroke of 6 inches. This was driven by an extension of the piston rod of the low pressure cylinder worked single acting.

**Details of the Automobile Type**—Coming next to the design of a lighter model suitable for automobile work, many changes from the stationary type are found. As shown in the large sectional views and the top or plan view, two power cylinders are used. These are supplied with fuel by a system of cylinders, tanks and piping, which includes a low-pressure cylinder marked 1, the piston of which is driven from one end of a lever, pivoted on the crankcase partition wall, the other end being reciprocated by a second lever attached to the piston pin of the power cylinder. The high-pressure cylinder marked 3 is operated in a similar manner from the other piston pin.

The engine operates upon oil as follows: air is drawn into the low-pressure cylinder (1), and after compression there, passes into the intermediate receiver and cooler (2), from which it is further compressed in the high-pressure cylinder (3). It is then delivered into the compressed air system, into which two receivers (4) are connected so as to furnish a means of starting the engine under load, as well as helping to carry overloads. Normally, these are, or may be, cut out by the valves shown. In running condition, the air passes from the high pressure cylinder to the exhaust gas heater and muffler (5). From the heater, the warmed air is admitted to the two power cylinders (6) alternately first to one and then to the other.

Oil is delivered from the oil pump (7) of the plunger type, driven from the overhead camshaft, into the pressure regulator



Construction of Fuel Regulator



(14), shown also in an enlarged view. This regulator has a flexible diaphragm at the center of which is connected a spring, located in a chamber to which the air has access at its highest pressure. To the other side of the diaphragm is attached a valve, situated in the space connected to the oil pump delivery pipe. The combined pressure of the compressed air and the spring tends to keep the valve seated, so that no oil flows. But when the oil pressure exceeds the other pressures combined (the hand wheel allows of adjusting this to the correct amount) the action of the diaphragm lifts the valve off of its seat and allows oil to escape. Under ordinary conditions, the oil flows through the valve (13) which opens simultaneously with valve (8) operated from the camshaft. Passing through the valve to the pipe (10) the oil is given a rotary motion which breaks it into a fine spray. This causes it to be uniformly mixed with the air charge, which enters at the same time through valve (8). Entering the combustion space thus, the combined air and

fuel charge is deflected toward the igniters (11) by the deflector plates placed in the cylinder head for that purpose. The ignition may be of any kind, although that shown was supposed to be of the regular jump spark type. After combustion, the burned gases are exhausted through the mechanically operated valves (9) and the auxiliary ports (12). A minor improvement consists in so shaping the cams as to change the period of valve opening by shifting the camshaft longitudinally. The speed of the engine may be controlled in this manner.

Principal among the advantages claimed for this style of engine are flexibility approaching that of the steam engine, highest efficiency, impossibility of preignition and consequent backfiring, more uniform turning effort brought about by the elimination of explosions, positive control, compactness, light weight and extended possibilities for the use of many and varied fuels other than the ordinary gasoline and the fuel oil used in this particular engine.

## NEW TYPE OF FRANKLIN AIR-COOLED ENGINE

**A**FTER six years of experimentation and construction, Ernest Franklin, Portland, Ore., has succeeded in building and operating an engine for automobiles and motor boats, which has a number of remarkable and very prominent features. Mr. Franklin's first field of experiment was the double-acting engine, but after long research in this line, he became discouraged with the results and turned to the two-cycle type.

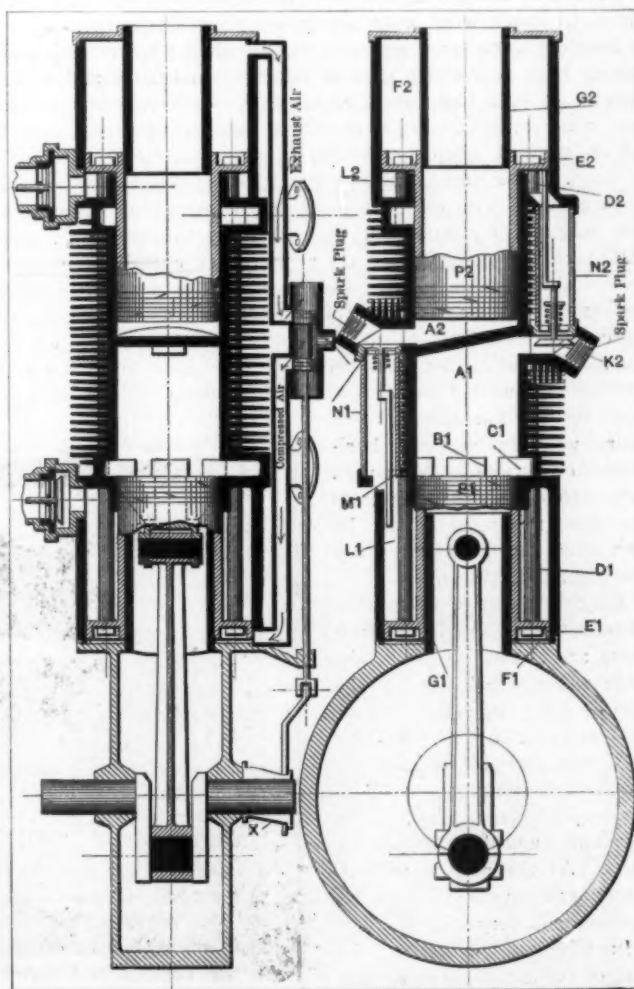
His latest production, shown in the illustration, is of the differential piston type of two-cycle motors, but has this radical departure from current practice: the cylinder is open ended and has within it two pistons. These are connected together by means of tie rods, and actuate a single crank. The engine is cooled by means of air, thus doing away with the troublesome water, piping, and pump.

As might be expected with an engine of this type, the explosions take place in the middle of the cylinder, where a partition is thrown across to divide the two and answer as a cylinder head. The charge is drawn in at the extremities of the two pistons of larger diameter. These compress it and deliver to the working pistons of smaller diameter, the upper one feeding the lower working piston while the lower furnishes the fuel to the upper piston. By an ingenious arrangement, camshafts are dispensed with and all valves are either operated by suction as in the case of the fuel inlet valves or are actuated from some other part of the engine as in the case of the admission of the compressed fuel from the differential piston to the working piston. This is done by the piston itself, which at the limit of its stroke opens a valve leading into the smaller cylinder.

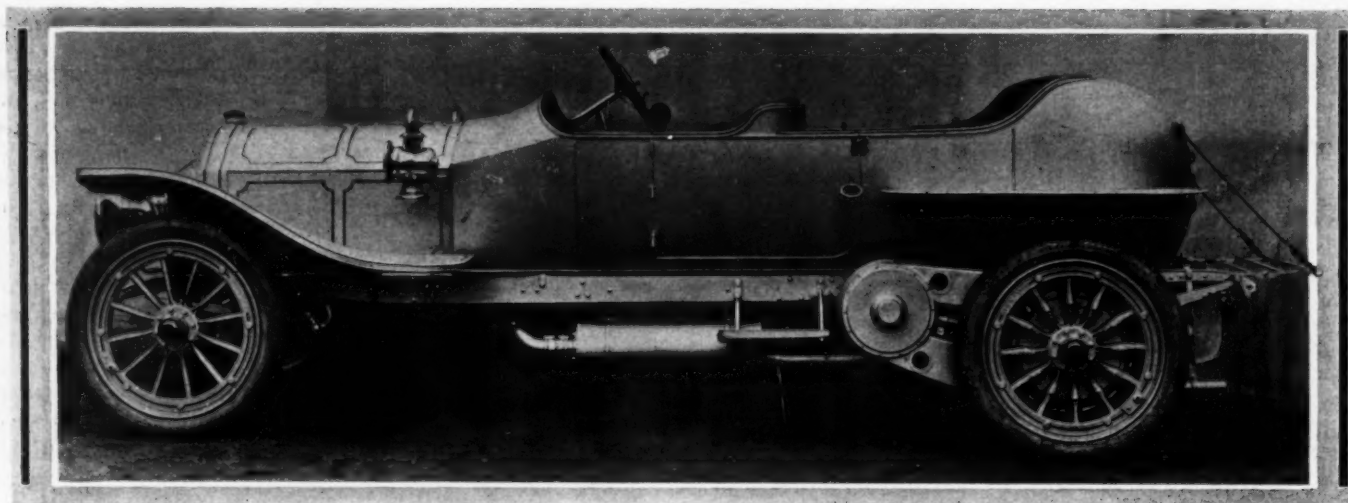
In addition to being air cooled, two-cycle, differential, two piston, this engine is self starting, that is, in the design provision was made for starting by compressed air. The sliding piston valve seen in the right side of the first section controls this. Air being admitted at that point, will pass up or down the jacket provided for that purpose, to the piston which is properly placed, and thus, turn the engine over. The piston valve just spoken of is connected with the crankshaft and in that way directs which piston will receive the compressed air.

All of the parts are marked with subscripts, the ones above the center being marked 2 and the lower ones 1. The pistons are P<sub>1</sub> and P<sub>2</sub>, and are connected by the tie rods D<sub>1</sub>, D<sub>2</sub>, which pass through bushings in the cylinder casting. The extensions of the pistons work in the larger bore, and convert the chambers L<sub>1</sub> and L<sub>2</sub> into compression spaces, L<sub>1</sub> supplying piston P<sub>2</sub> and L<sub>2</sub>, P<sub>1</sub>. The former works through the transfer port N<sub>1</sub> and the valve K<sub>1</sub>. The exhaust ports are cut right through the walls of the cylinder at C<sub>1</sub> for the lower piston. The sleeves G<sub>1</sub> and G<sub>2</sub>, shown in solid black, are said by the inventor to be placed in the cylinder for the sole purpose of allowing the compressed air starting arrangement to work. Be that as it may, as shown

in the working drawing of this engine, they are of such a small diameter that the connecting rods can only oscillate about 20 degrees each side of the center and cannot make a full revolution. A mere trifle like that should not worry a real inventor, however. Mr. Franklin states that he is now working on a two-cylinder engine with cylinders set at 90 degrees to each other, and working on a single crank, which he says would give four explosions per revolution and thus be equal to a regular eight-cylinder four-cycle engine.



Franklin Air-Cooled Two-Cycle Differential Piston Engine



A English Idea of the New Torpedo Body, on 60-Horsepower Mercedes Chassis

## BODY BUILDERS NOW EXERCISING MUCH INGENUITY

**S**PURRED on by the continuous calls for something new, different, or original in the line of coach work, Continental and English body builders have now gone far into a new line of body types. These are so radically different that with regards to them, all automobiling people at once line up in one of two classes—either the newest bodies are about the best thing ever, or else they are by far the most homely, not to say ugly, specimens of coach work ever produced by intelligent men.

Starting some years ago with the so-called Napier "bath tubs," bodies have followed a general tendency to length, and lack of height, giving a low, rakish appearance. Following in this same line came the side doors to the front seats, brought out last year, which attained much popularity.

Then, at the time of last year's Prince Henry trials, Germany took the lead with the dust-proof rear construction, from which the now popular name for this type, the torpedo body, came. Although the body shown on a Mercedes chassis is of home make, the idea is exactly the same as the German builders expressed in their work. While looking very peculiar, appearance alone had little to do with the shape, which was evolved as a solution of the dust problem. The idea in this was to prevent the suction of dust at the rear which obtains with any body having flat space at the rear, whether vertical, horizontal or inclined. Moreover, this shape does not concentrate its claim to usefulness in the one item, but possesses many meritorious features.

**Bulging Rear a Veritable Storehouse**—Chief among these are the utilization of the huge and unusual bulge at the rear as a storage place for tools and sundries. In actual capacity this is a veritable storehouse, as there is untold room here for tools, spare parts, extra garments, and luggage of all sorts. As the rear view with the doors open shows, the storage space is very large.

In addition to making the rear of the car dustless, so that in dry weather the tonneau is

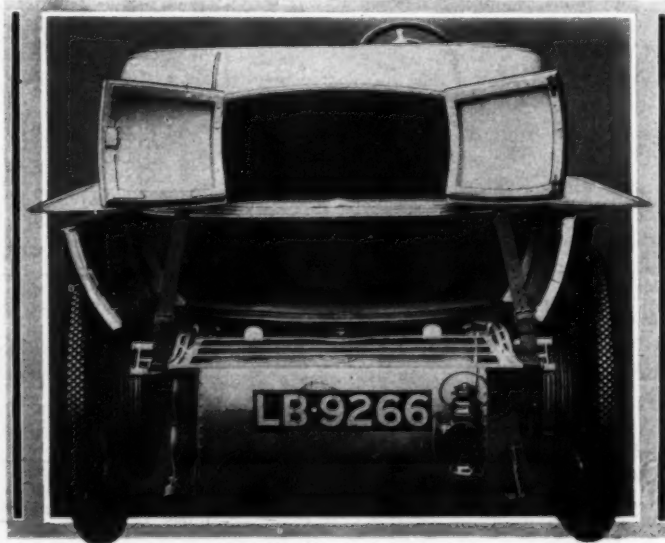
more comfortable even than the front seats, this construction allows of the practical removal of the rear fenders, with consequent improvement in the whole appearance. This car body was probably the first to appear with the single entrance to both tonneau and front seats, one long side door answering for both.

In this epochal body, too, appeared for the first time the flush sides as complementary to the dust-proof feature. It meant reducing the capacity of the car or else a tremendous wheel base, because the large tonneau capacity could only be obtained with bulging sides. The reduced capacity was well received, and many subsequent bodies have incorporated the flush sides until they have become quite general.

**Many English Firms Fell Into Line**—Quite taken with the natty and rakish lines obtained in this manner, many of the more prominent firms fell into line, notably Napier, Austin, Gregoire-Gordon, Brown, Arrol-Johnston, and others. Several styles of bodies by Austin's body builder are shown. In these it will be noticed that all do not agree. The large 100 horsepower chassis is fitted with a body creation along Mercedes lines, including the single side door opening toward the front. There are several noteworthy differences. Among them the most prominent is the substitution of the full rotund back shape in

place of the extreme torpedo shape, although even this body comes under the new classification of torpedo. With the elimination of the globular stern will be noticed the return to the use of rear fenders.

The earlier Mercedes bodies with the single side entrance had the left-hand front seat attached to the door, so that it rotated out over the step when the door was opened. In late models, as for instance the one shown, this is changed, and the door is so located as to straddle the length of the front seat, allowing entrance to the front, forward of it, and to the tonneau, back of it. The Austin provision differs from this and consists of tipping the left-hand front seat, it being back



Rear View, Showing How the Space Is Utilized



of the right-hand or driver's seat enough to allow the back of it in tipping to clear the back of the stationary driver's seat.

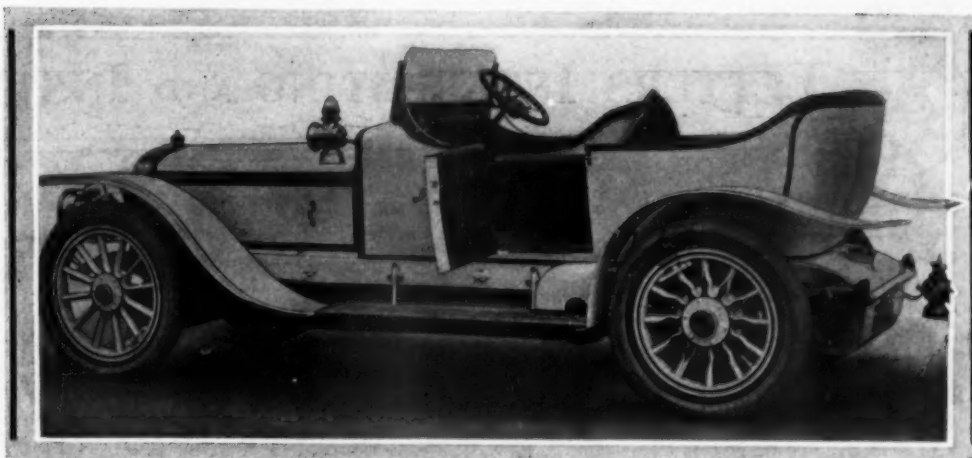
This particular car is one of the six-cylinder Austins that ran in the last Grand Prix race. Unlike the Mercedes body, which is of aluminum, this is made from selected woods.

**Builds Also for White Steamers**—The straight-line torpedo body on the smaller Austin is a product of Cann & Co., the London firm that builds the bodies for White steam cars over here. This little Austin has a four-cylinder engine rated at 18-24, with cylinders of 105 mm. bore by 127 mm. stroke. This body, it will be noticed, differs from the larger one, in that two side doors are used, although the straight lines in the side view are the same, as is also the rotund curve at the rear. The very narrow front door is placed close up to the dashboard and opens forward. The rear door, on the contrary, is very well placed, is very wide and commodious, and opens toward the rear. The fenders, too, are different. On the little Austin, the step is carried lower down to accentuate the low and long appearance and offset the short look which the wheel base of but 115 inches would otherwise give. To aid in this deception, both front and rear fenders are carried down with a sharp dip, the fronts at the rear end and the rears at the front end. While the whole effect is very much on the straight-line order every opportunity is seized to depart from this. It can be noticed in the deep curving dashboard, in both front and rear doors at the lower back edges, in the long fender sweeps, and elsewhere on the sides of the body.

**Extreme Only in Appearance, Not in Dimensions**—In all of the bodies shown, there has been a sensible compromise between the extremely high and equally uncomfortable seats of several years ago and the very low, undignified "couches" of more recent times. The latter, in some cases, went as low as 8 or 9 in. above the floor of the body, with the seat backs not over 18 to 20 in. total height. With these went the long leg room, which, coupled with the low seats, gave the body its long, low appearance. This increased and increased until it passed 36 in. In the torpedo types, the latter feature has been retained, but without extremes, a distance of 34 in. from seat to dashboard predominating. So, too, with the height of seats, the very low position, not being necessary to further the body lines, has been abandoned in favor of a more sensible, more dignified height. Probably most of these torpedo bodies upon detailed examination would be found to have not far from 12 in. from the top of the front seat cushion to the floor, this being increased to 14 in. in the tonneau.

Of the two styles of torpedoes brought out thus far, it would seem as if the rotund rear with straight line flush sides would be likely to meet with more favor than the globular shape, because the latter borders more on the extreme, although both savor of the shops, so up-to-date are they, or up-to-the-minute stated in more correct language.

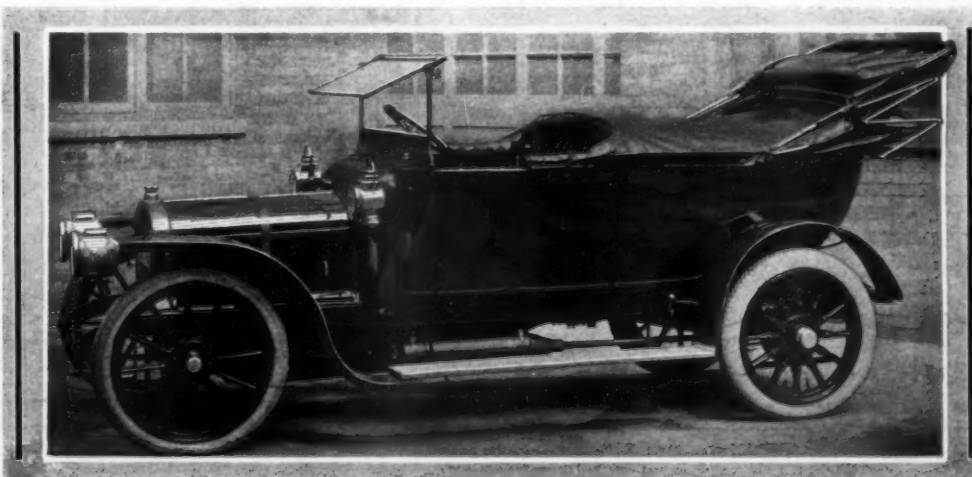
In all probability the future will bring out more and varied torpedo bodies, offering new suggestions, and doubtless many



Inclined More to the Rotund Curve with Straight Lines, 100-H.P. Austin

of them will bring forth additional ideas on the subject of dustlessness, as incorporated in the shape and proportion of the body, not only at the rear, but along the sides and underneath the body proper as well.

**New Little Mercedes Similarly Equipped**—The latest production of the famous Daimler works differs very markedly from its predecessors in mechanical construction, but is equipped with the now-famous torpedo shaped body. This new car has a small engine with an unusually long stroke, in which are shown the effects of the numerous competitions of the past year in which the stroke was unlimited. The motor is of 80 mm. (3 1/8 in.) bore by 130 mm. (5 1/8 in.) stroke and is rated at 15-20 horsepower. With the unusually long stroke, a ratio of 1 to 1.625, the power developed would be far in excess of even the higher rating. To this is fitted a flush sided body of the torpedo type, but with many differences from that of the larger and more powerful chassis. The elimination of the chain for driving and the substitution of shaft drive, changes the whole rear construction and also calls for rear fenders. This practically makes the front fender a necessity, and with both in use, the step is natural, while on the larger car, the practical elimination of both fenders made the use of the step superfluous. On the little car, too, the use of the two doors is at once noticeable. The rear is very similar to that ordinarily fitted to a short tonneau and opens to the rear in approved style. But the front door, on the other hand, is very narrow, very high in proportion to its width, and opens to the front. On the driver's side of the car, hinges are dispensed with and the door slides upward, being pulled clear up and out for admission on that side. The prolonged dash peculiar to all torpedo bodies is retained, while the body door, molding and other curves take away the very straight line.



18-24-H.P. Austin with Same Style of Torpedo Body, But Two Side Doors



## LETTERS INTERESTING AND INSTRUCTIVE



### NEW FRONT DRIVE SCHEME

Editor THE AUTOMOBILE:

[1,934]—While looking over the copy of the June 10 issue of "The Automobile," I could see no reason why the front drive need be so compactly or complicatedly built, so am sending you a sketch of an idea of mine for a front drive which is not so complicated.

R. T. PALMER.

Hampton, Va.

The sketch is shown elsewhere on this page and differs from other front drives only in that the engine is set in the standard and stereotyped position at the front and parallel to the axis of the car. Back of this is the transmission, which carries on the left side a pair of bevel gears. By means of these and a shaft drive back to the front axle, the power is transmitted. In this form of drive the power is transmitted from front to back and then from back to front again. What possible advantage there can be in this "gun-shoot-around-a-corner" scheme, only the inventor can see. A more reasonable method, if it is not desired to place the engine across the car, is to place the engine at the back and drive forward continuously from engine to transmission, to front axle.

The disadvantage of this is accessibility, which also applies to the design shown on the sketch. The transmission is under the body where it is very inaccessible. Also, the arrangement of the driving shaft would have to be such as to allow the front axle and shaft to rotate around the bevel, when the front wheels surmount an obstacle.

A disadvantage of this scheme, which the inventor has overlooked, is the fact that if the engine is placed in the center of the frame, the drive will have to be off center. Or, if the drive is set central, the engine will have to be off center. An equally weighty argument against this form of drive lies in the fact that at least three pairs of bevels will have to be used, and these are objectionable for they consume more power than do spur gears.

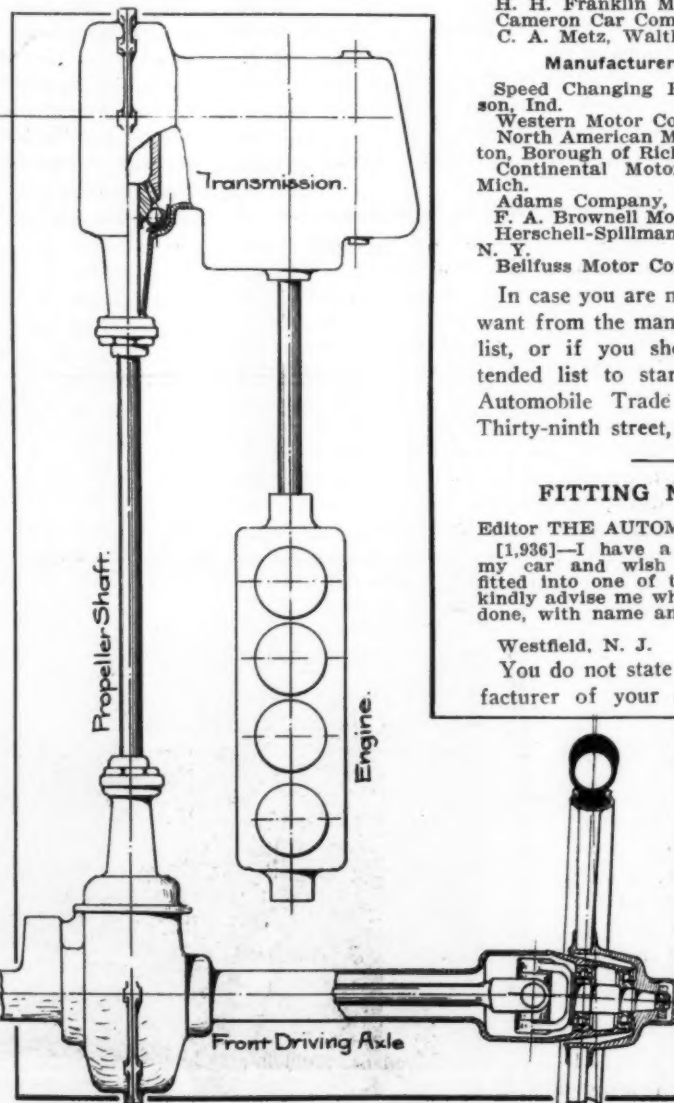
Since we are going into the disadvantages of the proposed scheme, it will be well to mention all of them. Thus, the center of the car location of the transmission will take just that much weight off the driving wheels. As weight means traction, this is an apparent disadvantage.

In his remarks about the compactness and complicated appearance of the front driving scheme of Christie, the father of this suggestion, missed the point. The car described does not have to have the compact drive as shown; in fact, this could have been worked out in a number of other ways, all possessing some merit. But this design was made special for a special service, and as such it has very much merit. If Mr. Palmer will reread the description, he will see on page

953, the situation is summed up as follows:

There is, however, a secondary advantage, which is alone and of itself amply sufficient to call for serious consideration of motor cab front driving and steering. This is the possibility of a front motive and steering assembly of small dimensions, entirely self-contained and very readily detachable from the remainder of the chassis and car body assembly.

This means that with one extra fore-carriage for, say, every ten cabs, the whole ten can be always kept in working condition with only the one small fore-carriage assembly in the repair shop, and all ten of the bodies and rear wheels assemblies out on the street earning money. With the rear wheel drive any failure back of the motor puts the whole car on the sick list, if, indeed, the motor is so constructed as to be readily removed from the car.



Palmer Front Drive with Motor in Regular Position

### SMALL AIR-COOLED ENGINE

Editor THE AUTOMOBILE:

[1,935]—Could you inform me where I could purchase a four-cylinder air-cooled motor of about ten or twelve horsepower and suitable for a midget automobile?

LEON PELLET.

Dallas, Texas.

The size of engine which you require is so small that we are unable to call to mind any firm making it. According to the A. L. A. M. rating formula an engine of 4-cylinder, 2 3/4 in. in diameter would be rated at 12.1 horsepower, and one of 2 1/2-in. bore would rate at 10 horsepower. These are very small sizes. However, we are giving below a list of car and engine builders, most of whom build some small-sized air-cooled engines. It is possible that the car manufacturers would not care to sell you an engine, but you can only try them and find out. The list follows:

#### Manufacturers of Complete Cars.

H. H. Franklin Mfg. Co., Syracuse, N. Y.  
Cameron Car Company, Beverly, Mass.  
C. A. Metz, Waltham, Mass.

#### Manufacturers of Motors Only.

Speed Changing Pulley Company, Anderson, Ind.  
Western Motor Company, Logansport, Ind.  
North American Motor Corporation, Stapleton, Borough of Richmond, New York City.  
Continental Motor Mfg. Co., Muskegon, Mich.  
Adams Company, Dubuque, Iowa.  
F. A. Brownell Motor Co., Rochester, N. Y.  
Herschell-Spillman Co., N. Tonawanda, N. Y.  
Belfuss Motor Company, Lansing, Mich.

In case you are not able to get what you want from the manufacturers on the above list, or if you should want a more extended list to start with, write to "The Automobile Trade Directory," 231 West Thirty-ninth street, New York City.

### FITTING NEW PISTONS

Editor THE AUTOMOBILE:

[1,936]—I have a two-cylinder engine in my car and wish to have a new piston fitted into one of the cylinders. Will you kindly advise me where I can have the same done, with name and address of firm?

WM. EHMLING.

Westfield, N. J.

You do not state the name of the manufacturer of your engine or car else we

would refer you to the makers, who are the best ones to do the work, as they will doubtless have pistons of this type on hand which will go right into place. If you have to have this work done in an ordinary machine shop it will cost you a lot of money, because it will be necessary for them to measure



up your piston, have a pattern made, get a casting from this, machine it up like the other piston, then balance the old and new ones exactly alike, and finally fit the new piston into the cylinder.

We might give you the name and address of a number of firms near you which would do the work, and do it well, but in view of the great expense connected with this method of procedure, as outlined above, it would be better to look for the name of the maker and go to him.

In default of finding this, or in the case that the car is an assembled one, it would be well to go to an automobile factory near you, as it might happen that they had a piston which was near enough to yours so that a good finished product could be produced from their casting. This would save you the first expense of measuring up your piston and making a pattern.

### SELF-STARTING MAGNETOS

Editor THE AUTOMOBILE:

[1,937]—In the June 10 issue of "The Automobile" in "Letters Interesting and Instructive" I note in answer to letter 1,908 that you state there are several magneto manufacturers who are putting out devices tending to start the engine by producing a spark, this being done by rotating the magneto armature. Will you kindly give me the names of these manufacturers, as I am interested in this and anxious to get in touch with them?  
E. J. WARING.  
Providence, R. I.

As to starting devices, you will find out much about these by simply reading over the pages of THE AUTOMOBILE, something on this order being published every little while. Descriptions of devices of this sort have appeared in recent issues, as follows:

December 17 issue, pages 859 to 860.

January 7 issue, page 25.

January 7 issue, page 26.

March 18 issue, page 486.

June 3 issue, page 927.

and, finally, if the subject of starting interests you, an excellent article on this subject headed "Self Starting Devices Attract Much Attention," by Morris A. Hall, appeared in the April 1 issue. This dealt more particularly with the mechanical than with the electrical schemes for starting the engine.

### VALVE STEM SIZES

Editor THE AUTOMOBILE:

[1,938]—Having seen a number of empirical formulas given in "Letters Interesting and Instructive," I write to ask you to give me one for proportioning valve stem diameters.  
SAM MANNHEIM.  
New York City.

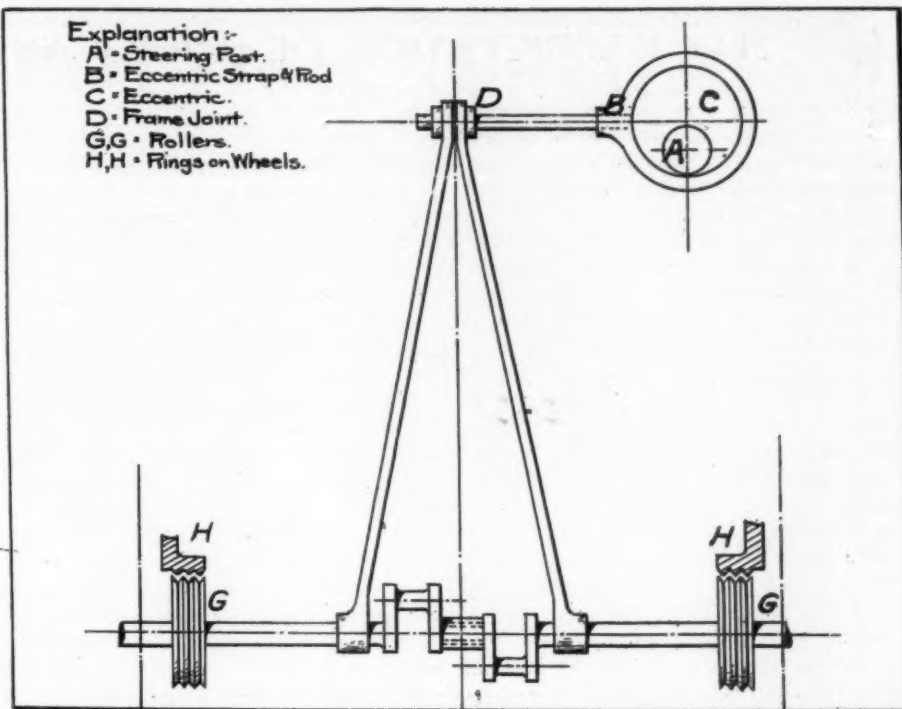
While we deprecate the use of empirical formulae for parts which may be calculated, you will find the formula desired below. Valve stems may be figured on the basis of any good column formula, taking into account the load on the head of the valve. A very nice looking valve stem will result, however, from the use of the formula:

$$D = \frac{d}{5}$$

In which D is the desired valve stem diameter; d is the clear diameter of the valve.

#### Explanation:

- A = Steering Post.
- B = Eccentric Strap & Rod
- C = Eccentric.
- D = Frame Joint.
- G, G = Rollers.
- H, H = Rings on Wheels.



Sketch of Duryea Differential Showing Operative Mechanism

### DIFFERENTIAL INTERESTING

Editor THE AUTOMOBILE:

[1,939]—Your reply to number 1,892 in "Letters Interesting and Instructive" about eliminating the differential and your remarks about the Gould patent in the June 3 issue of "The Automobile" are along right lines of thought and lead me to believe that you will appreciate a description of the Buggyaut scheme for getting around a corner. I send photo of the chassis and diagram of the substitute for a differential. In the chassis the two central bars running from below the cylinder heads to the support at the front are part of the engine and power plant frame. This power plant is hung to the side bars at one point on each side and these bars are supported at the third point front. This makes a three point support to the three pointed power plant. The driving rollers are at the rear points. The front point can be shifted sidewise. If shifted to the right it will throw the right roller to the rear. Or vice versa. A very little movement is sufficient to release the metal to metal contact between the rings and rollers.

On the steering post is an eccentric. Its center is forward of the center of the post. It is surrounded by a strap and has a rod running to the front point of the power plant. Adjusting nuts are provided so the rollers can be made to engage exactly alike. When the steering post is turned to the right in steering, the eccentric is thrown that way and the eccentric rod pulls the front of the power plant to that side which lessens or releases the contact of the right roller. This is of course the inner one and

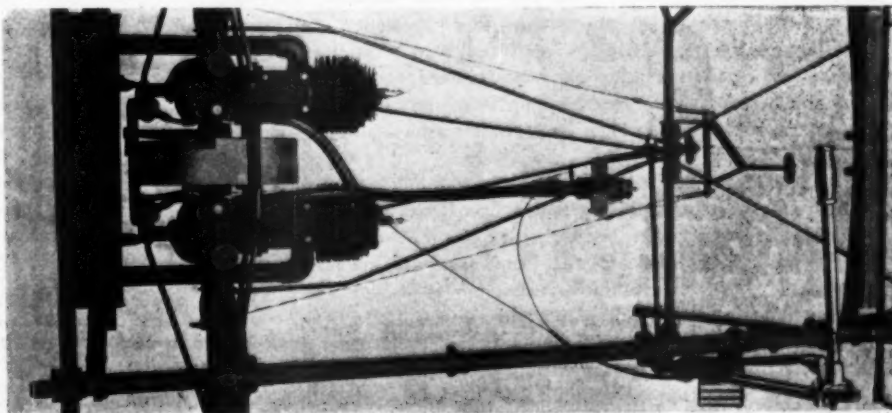
the proper one to release. The same action also tightens the outer contact and renders it able to take up the whole propulsion of the vehicle. The degree of release is proportional to the angle of the turn or practically so. The only parts required are the eccentric, its strap, rod and the two nuts. I cannot conceive a simpler device than this for the purpose.

And simplicity is not all, for it does the work better than the usual device. It drives the outer wheel. If one wheel slips on ice the engagement can be set tighter and it will then drive the inner wheel. In ordinary turning it drives the inner wheel some, although not powerfully. In straight going it drives both wheels alike. This makes it particularly adapted to solid tired rigs because their wheels bounce badly and with a balance gear of the usual type one or the other wheel is wasting the power of the engine by spinning in the air and then cutting the tires as they strike the ground. With the Buggyaut drive, the power of the engine is expended in propulsion so long as either wheel is on the ground. I feel sure designers and users have not paid enough attention to this part of the automobile's anatomy and am pleased that you are calling attention to it.

CHARLES E. DURYEA.

Reading, Pa.

The letter above from Mr. Duryea, as well as the two figures given, and the other devices are recommended to those interested in improvement of the automobile.



Photograph of Duryea Buggyaut Incorporating Differential

## MAY EXPORTATION OF AMERICAN CARS DOUBLES

TO patriotic Americans there is perhaps no feature of the automobile industry which interests them more than the growing exportation of domestic-made automobiles. For many years the balance has been in the other direction, but a tendency to turn has been shown; and, in fact, during the month of May just past the exportations far exceeded the importations. Of course there are many more people going abroad with their own American machines, but nevertheless, there is a steadily growing foreign trade in the automobiles from the United States. The Department of Commerce and Labor has just issued its statistical summary of the month of May, and a comparison with that of the same month in 1908. By this it is shown that the number of domestic cars shipped to foreign countries was double that of a year ago, and two-and-a-half more than that of arrivals this year. Yet the importation continues to grow, for the comparison shows a trebling of cars, and a doubling of the value of parts, brought over. As an important side line, the figures on india rubber indicate that the amount imported was less, but the value was greater than previously.

During the month of May 519 automobiles of domestic manufacture were sent abroad, valued at \$816,450, as against figures of 229 and \$389,487 for 1908. But at the same time, the necessity for supplying parts to American cars on foreign strands has decreased, for it is noted that this year the value of those shipped in May was \$60,427, as against \$69,570. It is likewise interesting to notice which countries have been included in the growing adoption of our nation's products in motor vehicle lines. The United Kingdom took a valued allotment of \$281,180, doubling that of May a year ago; Italy received four times as many; British North America trebled its demand, taking cars worth \$281,806 more than the mother country; the West Indies and Bermuda also received three times the former figures, and

other parts of Europe, and British Australia both doubled their requirements. France and Germany both received more than in May, 1908, and Africa increased its valuation of imports from \$127 to \$3,422. There was also a decrease seen in some sections between the two months under consideration. Mexico dropped slightly, from \$39,908 to \$32,009; South America, from \$21,534 to \$14,913; the British East Indies, from \$1,611 to \$28 (automobile parts); other Asia and Oceania, from \$10,598 to \$666; and other countries, from \$662 to \$375. The decrease in the amount of parts necessary is, of course, a pleasing feature, showing improved wearing quality of American cars.

As to the importations of foreign-built cars to this country, the figures change from 72 in May, 1908, to 193 in this year, with the value from \$170,185 to \$301,971. A great many of the cars brought in were taxicabs. France has a strong lead, with 148 shipments, and the other countries are: Italy, 28; Germany, 8; United Kingdom, 5; all other countries, 4. The standing has not changed in the year. The sum of parts received almost doubled this spring, increasing to \$72,616 from \$42,515.

The situation in the rubber industry may be imagined from the fact that this year the importation was of 6,363,955 pounds as against 7,823,323 pounds, but the value changes in a different ratio, from \$4,164,578 last year, to \$4,450,356 this year, indicating an increase in the price of the raw materials.

British North America leads in the purchasing of American cars, with the United Kingdom second; France, third; other Europe, fourth; Mexico, Italy, Germany, the West Indies and Bermuda, and South America, following in the order named. This is considerable of an alteration in the score for May of last year, which read: United Kingdom, France, British North America, Mexico, Germany, South America, other Europe, other Asia and Oceania, and the West Indies and Bermuda.

### NEW BOOKS FOR AUTOMOBILISTS

**Internal Combustion Engines**—As the title would indicate, this work deals primarily with the internal combustion *per se*, and not alone with its application to the automobile. However, all but five of the twenty-three chapters are pertinent to owners or operators of automobiles, and even those have an indirect interest. The five exceptions are Chapters III. on Diesel engines, VIII. on producers, XVII. on frames, XVIII. on foundations and XX. on governing. The first and last of these, it is true, have something of great interest as representing future possibilities than present everyday use.

Of the other chapters, the history of the gas engine is well written, and the two and four cycles are carefully explained in terms which the beginner could easily understand. One of the best chapters in the book deals with carbureters and fuel vaporization. With the exception of the extensive notice given to mixing valves, which are not in general use, this is excellent and brings out the principal points relative to fuel vaporization, always a difficult subject, in a very clear and intelligible manner. The chapters devoted to compression and the indicator card include all of the abstract mathematical formulæ given and are worthy of some study.

Most of the rest of the book is devoted to the detailed dimensions of the parts. In this, it appears as if the stationary engine is given the preference. Formulæ are given so that this portion of the book would be of great service to the designer. This part of the work, as would be necessary if it would be of use to designers, is right up to date, and valves in the head, copper water jackets, single cam for two valves, and other items of latter-day practice are described and commented upon.

The book is written by William M. Hogle, B. S., and published by the McGraw Publishing Company, 239 West Thirty-ninth street, New York City.

### AUTOMOBILE CALENDAR OF EVENTS

#### Shows, Meetings, Etc.

- Aug. 5-7.....Chicago, Midsummer Meeting Society of Automobile Engineers.
- Nov. 6-13.....Atlanta, Ga., Auditorium-Armory, National Automobile Show.
- Dec. 31-Jan. 7....New York City, Grand Central Palace, Decennial International Automobile Show; American Motor Car Manufacturers' Association, with Importers' Automobile Salon and Motor and Accessory Manufacturers. Alfred Reeves, General Manager, 505 Fifth Avenue, New York.
- Jan. 8-15.....New York City, Madison Square Garden, Tenth National Show, Association of Licensed Automobile Manufacturers.
- Feb. 5-12.....Chicago, Coliseum, Ninth Annual Automobile Show, National Association of Automobile Manufacturers. S. A. Miles, General Manager.

#### Races, Hill Climbs, Etc.

- July 12.....Detroit, Start of Sixth Annual A. A. A. Tour for Glidden Trophy.
- July 12.....Portland, Ore., Road Contest, Portland Automobile Club.
- July 31.....Richfield Springs, N. Y., Hill Climb, auspices of the "Earlington."
- Aug. 5.....Chicago, Fourth Annual Algonquin Hill Climb, Chicago Motor Club.
- Aug. 26-28.....Minneapolis, "Little Glidden Tour," Minnesota State Automobile Association.
- Aug. 19-21.....Indianapolis Motor Speedway, First Race Meet.
- Sept. 6-11.....Lowell, Mass., Automobile Carnival, Lowell Automobile Club.
- Sept. 15.....Denver, Col., Start of Flag to Flag Endurance Run to Mexico City.
- Oct. 7.....Philadelphia, Second Annual Stock Chassis, 200-mile Race, Fairmount Park, Quaker City M. C.
- Dec. 29-30.....Philadelphia, Fourth Annual Midwinter Endurance Contest, Quaker City Motor Club.



# THE SCOTTISH TRIAL

By Joseph A. Mackle



Climbing Amulree Hill  
near Loch Freuchie

GLASGOW, June 21—The searching nature of the annual trial of the Scottish Automobile Club has always been admitted, but there is no doubt that the event just completed ranks far ahead of its predecessors in this respect. Before mapping out the course of 1,000 miles, longer by 200 miles than the usual distance, the trials committee had scoured all the byways and mountain tracks of the northern country, and the net result proved to be something of a startler for most of the competitors. But, then, the modern car is so reliable under normal conditions that it requires an extremely severe test to render defects apparent, and only a gruelling such as is rarely encountered under normal conditions can afford a reliable indication to the buying public. Nineteen only of the sixty-five cars that started away on Monday last have returned with clean records—a proportion much smaller than usual—showing that the trial has succeeded in its object, while at the same time, the fact that no less than 58 cars finished in schedule time speaks well for the general qualities of both the cars and their drivers.

The total distance was divided up into six daily runs of approximately 170 miles each, and, as noted later, every part of Scotland—save the extreme south—was traversed, and every conceivable variety of road encountered.

**Sixty-five Starters Divided Over Eight Classes**—The 65 cars were divided into eight classes on a price basis, but in Class H, for price above \$3,250, the 50-horsepower Ariel was ranked by itself, which fact clearly demonstrates the decrease in popularity of the big car. By far the greater number of cars were of British origin, while the only representatives of America were the 10-horsepower and 20-30-horsepower Cadillacs, in classes B and D respectively. Both of these cars maintained their customary reputation for reliability, but while the latter made a perfect score, the former was delayed three minutes on the road for the fitting of a new commutator spring. This is the first stop that F. S. Bennett, the Cadillac representative, has had in any of the five annual trials in which he has driven.

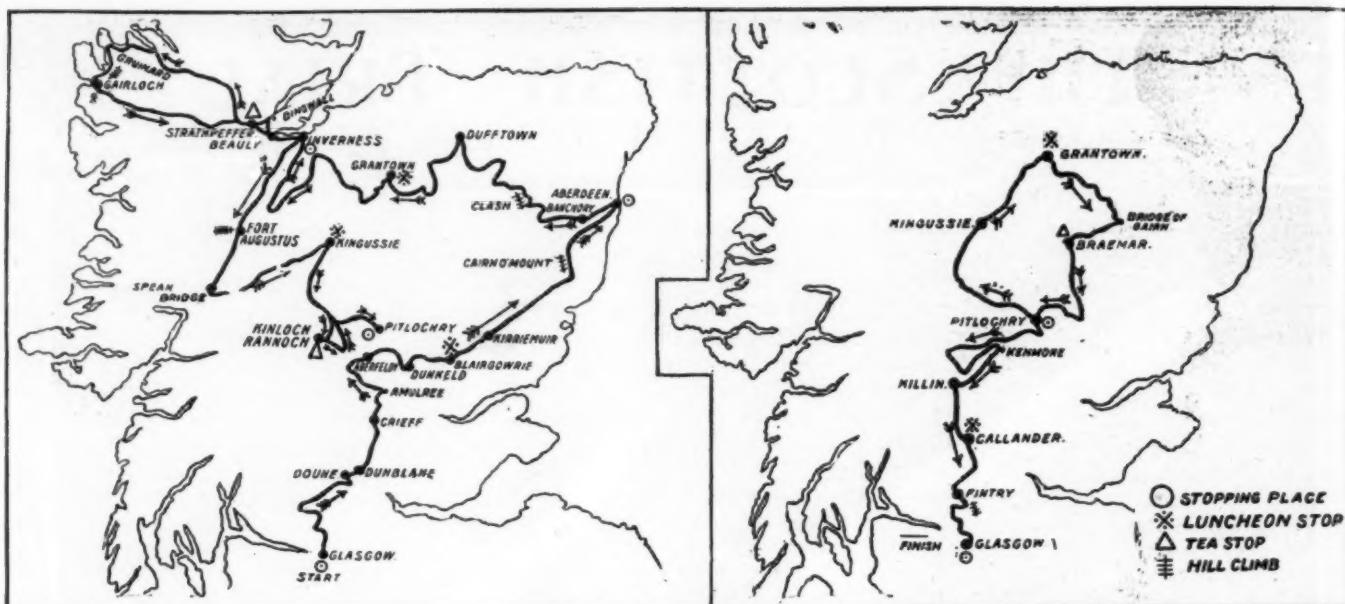
After an early start at 7 A.M. on Monday, the cars were driven north to Aberdeen, but instead of the main road, a circuitous journey was taken to include the now famous Amulree and

Cairn O' Mount Hills. The former of these has several pieces of reputed 1 in 4 (25 per cent) grade, and as these are found on bad hairpin corners, the drivers had a very exciting time. Nearly a dozen cars had to shed passengers or else required assistance, and these failures were by no means confined to the smaller classes, for overgearing seemed to be a general fault. The drop on the other side of Amulree was, if possible, worse, and the consensus of opinion now at the end of the trial is that this hill is the stiffest to be met with in the whole of Scotland. The Cairn O' Mount climb in the afternoon was easy by comparison, and after a dusty run the full number of cars reached Aberdeen inside the time limit.

The next day's results were not so fortunate and the eliminations commenced early. Most beautiful country was traversed on the road for Inverness, which included in its course some severe climbing over Cairngorm. The ascent from the Bridge of Avon overheated the 8-horsepower Chenard Walcker so much that a cracked water jacket ensued, causing the withdrawal of this sturdy little car. Immediately afterward the 45-horsepower Austrian Daimler was withdrawn.

**Austrian Daimler Out on Account of Overgearing**—This car is a new production from the Neustadt works of the Mercedes Company and was expected to put up a very creditable performance, but its gearing was much too high for Scottish roads, so that on several hills outside assistance had to be called up. The smaller car of this make, rated at 30-horsepower, made a much better showing. Throughout this day overheating was prevalent to an unwonted degree and many cars hitherto blameless in this respect experienced engine and radiator troubles. The timed ascent was at Clash Hill, but on account of the comparative easiness of the grade, which nowhere exceeded 1 in 10 (10 per cent), only classes A, B, and C were raced up it. The Riley runabouts took the honors in the first two and the 10-12-horsepower Humber in Class C—a state of affairs maintained throughout the series of climbs.

In the afternoon, near the Fall of Foyers, famed for its aluminum works, the big Ariel struck a corner, but after a change of the Rudge-Whitworth detachable wire wheels, the car was



Plan of route for the first, second, third and fourth days

Plan of the route selected for the fifth and sixth days

Outline Maps Showing the Ground Covered in the Scottish Reliability Trials

able to proceed. The Gregoire and Rapid cars had lengthy stops on the road, and the 38-horsepower Knight-Minerva, which had quite come up to expectations on the hills, spoiled its record by an hour's clutch trouble.

Wednesday took the cars over new ground, right across to the western seaboard. Desolate marshes and lonely glens afforded a strong contrast to the country previously traversed, and the newness of the scene quite atoned for the execrable nature of some parts of the road. On one of the worst places the 40-horsepower Gladiator broke a front spring, quite an unusual occurrence—on this side, at any rate. On reaching the coast the cars dropped down to sea level in order to ascend the cliffs again by Gruinard Hill. After the formidable tasks of the first day Gruinard proved less trying than had been anticipated, and no failures were reported. Gairloch was the place of the luncheon stop, after which a straight run across the most beautiful part of the whole tour led back again to Inverness. Troubles were conspicuous by their absence, and, additional to the Gladiator, only the 20-horsepower Sunbeam experienced long delay. This, caused by a punctured carburetor float, was the first stop experienced by the driver, Eastmead, in the five annual trials. A like run of success was spoiled on the following day, when Bennett had a stop of but three minutes on his Cadillac.

**Foreigners Win Thursday's Hill Climb**—The cars headed southward again on Thursday, following the course of the Caledonian canal as far as Fort Augustus, where, alongside the ancient Benedictine monastery, a hill-climb was arranged for the bigger cars. On the previous days the British cars had been having all the awards in the climbs, but now the tables were completely changed and the Austrian Daimler and the Adler both swept the board in their classes. Many cars experienced trouble later in the day and less than half the cars finished at Pitlochry with a clean record from the commencement of the trial. Both the 20-horsepower Mass and the 30-horsepower Vinot were withdrawn, a succession of minor stoppages having robbed them of all chance of success.

From Pitlochry a circuit of 160 miles was made on Friday over the stiffest country that could be found. The Bridge of Avon and the other severe hills of Tuesday were taken in the reverse direction and the ascents and descents were universally reported to be much worse than previously. Fortunately the weather remained good—quite a record for the Scottish Trial, which has usually been run in a continuous downpour from start to finish. On this route the brakes of the cars were tested by the officials at a surprise control, and despite the fact that,

by a wise dispensation, free time was daily allowed for brake adjustment, three cars were penalized for failing to come up to the required standard. No timed climb was held on this run and stoppages were less in evidence, so that 40 cars managed to make a non-stop for the day. The fates were less propitious on Saturday, and during the final portion of the run back to Glasgow the Argyll and the S. P. A. were put out of the running by a broken connecting rod and a stripped differential pinion, respectively, both cars by chance having had a perfectly clean record up to this point.

Of the 65 starters no less than 58 completed the trial, a highly satisfactory result when the unusual severity of the test is considered. Forty-three non-stops were recorded for the last day and for the total distance the following 19 cars had no penalties against them:

Class A—None.

Class B—12-horsepower Adler, 12-18-horsepower Riley.

Class C—10-12-horsepower Humber, 14-16-horsepower Miesse.

Class D—15-horsepower Mass, 20-30-horsepower Cadillac, 15-horsepower Straker Squire, 14-16-horsepower Argyll, 15-horsepower Star, 16-horsepower Singer.

Class E—20-horsepower Vauxhall, 16-horsepower Humber, 20-horsepower Lancia, 15-horsepower Rover, 12-horsepower Talbot.

Class F—18-horsepower De Dion, 14-20-horsepower Sunbeam.

Class G—30-horsepower Adler, 24-30-horsepower Albion.

Class H—None.

For the final awards the results of all the climbs are taken into account, as well as the fuel consumption, so that the placings will not be known for another week. The formula used was:

Total Marks =

Marks for reliability +  $\frac{\text{Total Marks for Hill Climbing.}}{\text{No. of Hill Climbs.}}$

$\frac{\text{Lowest fuel consumption}}{\text{per ton mile in Class}} \times 100$

+  $\frac{\text{Fuel consumption per ton mile}}{\text{per ton mile in Class}}$

Maximum marks for reliability were 850; for each climb, 50.

**Kennels on Autos for Canine Travelers**—An English automobile firm, according to *Popular Mechanics*, has built a car with a body which opens at the back, revealing a roomy kennel for carrying dogs. It is the idea that the cars run too fast for dogs to follow on foot, or to trot contentedly along between the rear wheels of a carriage, as when the horse was supreme. The general impression, however, is that the dogs will not be at all satisfied with being cooped up at the rear, for those seen in autos generally insist on having the seat of honor—next to the driver.



## EDGE IMPRESSED WITH AMERICAN AUTO INDUSTRY

LONDON, June 29—Selwyn F. Edge, the well-known British autoist, has returned from his trip to the United States enthusiastic over the progress of the industry there. That he was evidently impressed by its development has been shown by the statements made by him in interviews, and his opinions have considerably surprised English manufacturers. It has not been generally accepted that the production of the American factories for 1909 of cars that are really serviceable would reach the sum of probably 80,000. Nor has it been thought that the increase predicted to perhaps 175,000 automobiles for 1910 was anything but publicity. Mr. Edge, however, has assured his fellow-makers that these reports are correct, for he has seen evidences of them. He says:

"Nearly everybody in America is going in for some sort of car and the fever has reached the remotest villages in the farming regions. Many farmers have learned that the automobile is not only a great machine for pleasure, but an even more impor-

tant means of pushing modern business. Gasoline, sooner or later, in large measure will supersede the horse in hauling grain to market and drawing heavy plows. American manufacturers of cars are close students of the demands of public conditions in the country. They are also ingenious, inventive, and immensely enterprising. The finest cars made in America are equal to the finest made in the world, and the cheaper American cars are without equals in any other country. They give more value for their cost, weight, and size than any other article of manufacture on wheels. Unless the European manufacturers wake up to the importance of the cheap-car market, and produce more cheap cars; and better ones, the Americans are going to sweep Europe with these machines as they are now sweeping America.

"The Yankees have lots of bad roads, but they are finding out the best way to negotiate them in automobiles. Moreover, they build cars that go after bad roads and hills like a hungry boy after popcorn."

## BRITISH PRESSITES "SENT FROM COVENTRY"

LONDON, June 22—Newspaper representatives of the British Empire, attending the Imperial Press Conference, were given an especial treat on June 15 as the guests of the Daimler Company of Coventry. A beautiful ride in thirty-three of the newest of English Daimlers through the Shakespeare country, an impromptu hill climb, and lunch at Warwick Castle featured a memorable day. The journalists assembled on a special train which reached Coventry at 11.30, and at the immense works of the automobile builders a reception was tendered them by the Mayor and officials, including C. Y. Knight. After inspecting the factory the party took possession of the automobiles and

were conveyed to Warwick Castle, via Kenilworth and Leamington, where Lord and Lady Warwick entertained at luncheon.

The famous Sunrising Hill was an interesting part of the route and the Daimler Company had arranged a telephone system to insure safety. All machines went up with little difficulty and the journey continued to Cromwell's Tower, where a beautiful view of the Avon valley is obtained. Tea was served at the White Lion, in Banbury, and the run to Oxford made in the evening, the delegates spending the night in the university town. The Daimler Company not only furnished the cars but in many small ways cared for the comfort of the tourists.



Press Delegates Visit  
Warwick Castle

# What the Clubs Are Doing These Days

## MINNESOTA PLANS "LITTLE GLIDDEN TOUR"

MINNEAPOLIS, MINN., July 3—A "Little Glidden Tour" is now being arranged by the officers of the Minnesota State Automobile Association and will be held on August 26, 27 and 28. It is proposed to make the event a strictly amateur event run under the same rules as the Glidden tour. The St. Paul *Despatch* has given the principal trophy, a \$500 silver cup, which is to be contested for annually, and Col. F. M. Joyce and H. S. Johnson have each given a \$100 trophy, to go at once to the clubs whose cars win in the runabout and in the toy tonneau classes. Three routes are projected, one to Fargo, N. D., and return; another through Southern Minnesota, visiting 15 towns and cities where there are live automobile clubs, and the third route to Duluth and return. Each club in the State association, of which there are 25, will enter one and possibly more cars, and in all at least 40 cars are expected. H. S. Johnson, chairman of the tours and contests committee, will have associated with him on that committee one representative from each of the clubs.

## SPRINGFIELD, MO., CLUB A REALITY

SPRINGFIELD, Mo., July 5—For the past two years the Springfield Automobile Club has been an organization in name only, but a number of the automobile owners have set about to resuscitate it. The following officers have been elected: President, W. H. Horine; vice-president, Holland Keet; secretary, J. E. Atkinson; treasurer, Robert L. Pate. Two matters of immediate interest brought about this movement: first, to determine, if possible, upon the persons who have been stretching wire across the National boulevard, causing two accidents to autoists; and second, to organize a tour to Kansas City to meet the Glidden tourists. It is probable that a number of local cars will leave this city on July 26 to see the finish of the big contest.

## HARTFORD HAS PARTIAL ORPHANS' DAY

HARTFORD, CONN., July 3—There seems to be something always interfering with the Automobile Club of Hartford's celebration of orphans' day. It had been planned to hold it during the national week, but rain prevented. The following week the children had some other function, and ever since then the club and the institutions have been unable to set mutually favorable dates. The club members have decided to let the orphan asylums name the day for the outing. About 50 of the children from the St. Patrick Orphan Asylum were given an afternoon diversion on Wednesday, when they were taken to Cromwell, where refreshments were served in a cool, shady grove.

## BAY STATERS DECLINE UNION

BOSTON, July 3—The latest attempt to consolidate the Bay State Automobile Association and the Boston Motor Club, under the name of the Bay State Motor Club, has come to naught. The members of the Bay State Association at a special meeting this week refused to accept the terms agreed upon by the directors of the two organizations.

## ROCHESTER AUTOISTS ASK POLICE POWER

ROCHESTER, N. Y., July 5—The Automobile Club of Rochester has decided to assist the local police authorities in stopping speeding, by watching its own members. It is planned to have ten members with police power to report those who drive too fast. The latter will be asked by the club to desist or be reported to the police.

## GOOD ROADS CONCERT IS A NEW ONE

LANCASTER, PA., July 5—Agitation in favor of good roads has assumed many forms, but the Lancaster Automobile Club has discovered the newest one, that of giving concerts in behalf of better highways. In different localities out through the country, semi-monthly entertainments are held with the best musical talent procurable, and a nominal admission fee charged. The event is widely advertised in advance as "for the benefit of the good roads movement in Lancaster County," and a split-log drag is kept in front of the concert hall for several days previous to the musicale. At the most recent of these affairs, held in the Borough of Mount Joy, club members attended from all over the county, and the farmer element was proportionately strong. About \$100 was cleared for future expenditure in conducting the good roads campaign. As a result of the work already done the county clay roads are in splendid condition, in some places being much better than the old pikes.

## CHARLESTON, S. C., AUTOISTS ORGANIZE

CHARLESTON, S. C., July 5—For many months the automobilists of this city have talked of and much desired an automobile club, to foster their interests along lines of legislation, good roads, and sports. On Wednesday evening a number of them met and formed what will be known and incorporated as the Charleston Automobile Club. The following officers were elected: President, Wilson G. Harvey; vice-president, E. W. Durant, Jr.; secretary, Lane Mullally, M.D.; treasurer, F. G. Davies; solicitor, J. N. Nathans, Jr. These officers, with C. Norwood Hastie, Julian Mitchell, and E. W. Hughes, will form the charter members and take the first steps toward increasing the membership, determining the amount of dues, and considering any other immediate questions. At an early meeting it is planned to elect a board of governors and appoint a number of committees. Inasmuch as there are over 175 automobilists in the city a representative number is expected in the new organization.

## NEW CLUB FORMED IN DETROIT

DETROIT, July 5—The Detroit Motor Club is the latest addition to local automobile organizations, having been launched last Thursday evening. Over 100 members have already been secured and it is predicted that inside of two months the list will have been increased to a thousand. Officers elected for the ensuing year are: President, Joseph F. Stringham; vice-president, J. S. Haggerty; secretary, John Gillespie; treasurer, George S. Lawson. The board of directors consists of these officers and Herbert J. Flint, Frank Briscoe, W. F. V. Neumann, Robert K. Davis, Charles Grant, Robert Kuhn, and T. W. Henderson.

All owners of motor cars are eligible to membership and it is planned to give Detroit an automobile club on a more practical and comprehensive basis than it has ever had.

## SPRINGFIELD HAS SECRET TIME RUN

SPRINGFIELD, MASS., July 2—For a genuine good time, and a contest feature that gave every man an equal chance, whether his car had a single cylinder or six, the reliability run of the Automobile Club of Springfield went far ahead of anything the organization has ever fostered. Carrying about 100 people, 26 automobiles participated in the event on Monday, but the findings of the committee were not announced until last evening. In reality the competition was a side issue, as compared with the good fun expected and found by those who entered. A route



of 37 miles in length had been selected, over which the cars were to be driven at an average speed of 15 miles an hour, and there were secret checking stations to see who came nearest to this. Principally, however, there was a clambake at the finish, at the Auto Inn, North Wilbraham.

When the scores of the cars had been carefully examined it was found that Henry Cave had taken his Stevens-Duryea through on the best schedule, his total time off at the various stations being 3 minutes and 38 seconds, thereby winning the Fisk Rubber Company's silver cup. This must be won three times in succession by the same person in order to secure it as a permanent possession. George L. Aikey, in an American roadster, took the second honors, and was awarded the Stevens rifle donated by the Stevens-Duryea Automobile Company. James Duckworth, in a Knox, won third prize, the Knox Automobile Company's gold medal; and a basket of lemons and carnations was given to J. C. Burke as a consolation. Mr. Burke drove his Cadillac with little regard for the time, and was almost two hours off. Only bona fide club members in good standing were allowed to compete.

The start was made from the club headquarters in the Worthy Hotel at 9 o'clock in the morning, an hour after H. S. Sterns, in the confetti car, had left to mark the crossroads and turns. The first car away was that of Harry Fisk, and the others followed at intervals of three minutes. When 19 had been sent off there was an intermission of half-an-hour. Then the remaining contestants proceeded, also with the three-minute separation, Dr. F. C. Collins bringing up the rear with a large American flag, in his Cadillac, to mark the end of the caravan. The police closed Worthington street during the preliminaries to prevent confusion. The machines swung away from the checker toward Brightwood, out Chicopee street, over the State road, through Aldenville, Williamansett, Holyoke, South Hadley Falls, Granby, Belchertown, Ludlow reservoir, Boston road, Nine-Mile Pond, and to the Auto Inn, at North Wilbraham. Stop watches, odometers, speedometers, and dash clocks received the most critical inspections of their existence, even more so than when police traps abound. This was no more than reasonable, since in the one case an error meant little while in the other case it was sure to disqualify the owner from the contest. Some of the results obtained in this way were truly remarkable.

The first checking station was between Granby and Belchertown, with Ernest J. Dexter in charge; and the second was at the 30½-mile mark, near the Ludlow reservoir, presided over by Frank W. S. King. The contestants had all checked in between 11 and 12 o'clock at the inn, and while the clambake received its finishing touches, picked teams amused the crowd by playing "at" baseball. By the time the non-contestants had arrived the entry list for the clambake had increased to about 140. The committee in charge of the entire outing was comprised of Dr. C. S. Murless, T. B. Gilbert and H. S. Stearns.

## AUTOING GROWS IN WESTERN CANADA

WINNIPEG, CANADA, June 26—The present year has seen a wonderful growth in automobiling throughout Western Canada, and dealers have found it impossible to fill orders which have been placed for cars. The vigorous selling campaign which was carried on throughout the prairie provinces during the Winter and early Spring months resulted in numbers of cars being sold in all the small towns, some of which, with a population of less than 500, now having seven or eight automobiles to mark the general prosperity which resulted from the harvest of 1908.

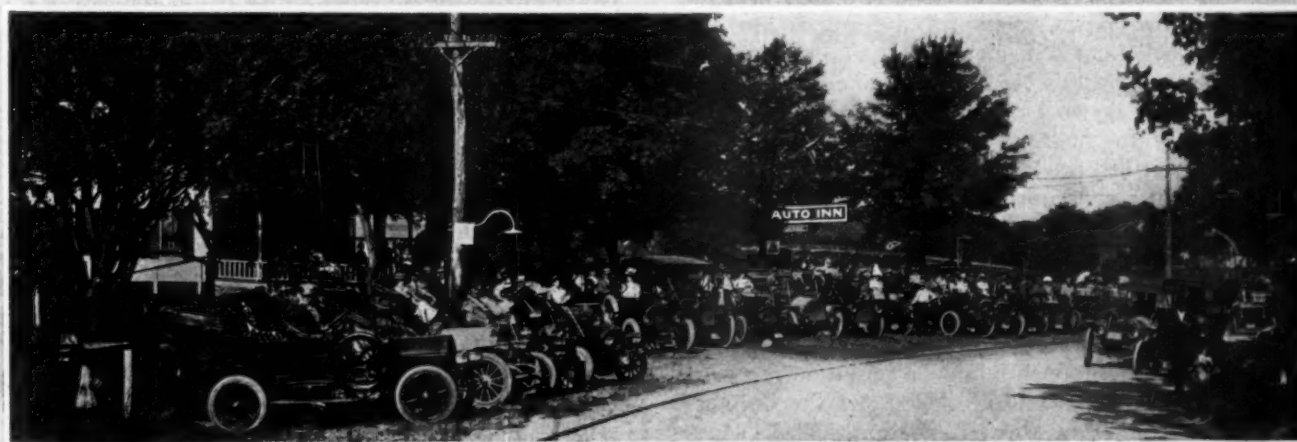
In Winnipeg, the great distributing centre of Western Canada, the phenomenal increase of business has made it necessary for some of the dealers to increase their garage facilities, the McLaughlin Carriage Company, Ltd., of Oshawa, Ontario, having erected a fine new building in Winnipeg as headquarters for its western business. The construction throughout is of reinforced concrete, making the building practically fireproof. Accommodation is provided for upwards of 100 cars, and the repair shop is equipped with the most modern plant. A new concern under the name of the Canadian Western Electric Automobile Company, Ltd., has been incorporated with a capital of \$30,000, and will manufacture storage batteries, dry cells, and a small electric vehicle, the design of which has not yet been settled.

The good-roads movement has received considerable support, and a joint committee of representatives from the city of Winnipeg and neighboring municipalities has been appointed to arrange a combined method of carrying out the improvements. The provincial government has signified its intention to assist the movement, and it is confidently expected that when the 1912 world's fair takes place in the prairie capital, there will be hundreds of miles of good roads running into the city.

The Automobile Club has arranged for a pleasure tour commencing on or about August 7, to Regina, and W. C. Power and H. A. Aylwin have been appointed official pathfinders, and will leave Winnipeg early in July to map out the route. Immediately following the tour, the annual reliability run will be held over the same route as in 1908, for the Oldsmobile trophy. The speed events for the Dunlop trophy will be held on the Kirkfield track, but no definite date has yet been fixed for the event.

Commercial vehicles are gradually coming into use, the Canadian Pacific Railway Company having three big Argyll trucks; the Canadian Northern, three Packards; the Central Dray Company, a "Rapid" light van. The Maple Leaf Renovating Company has a small delivery machine which is making a good showing for quick delivery of small parcels, and attracting the attention of the retail merchants toward modern means of transportation. If this year's harvest is satisfactory, the sale of cars next year will far outrival even the present season's record.

In this way a few are converted each year to the commercial cars, and they, in turn, convert their neighbors, so that the number of vehicles in use grows every year.



Reliability Run of the Automobile Club of Springfield, Mass., at the Auto Inn, at North Wilbraham



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## AN EPOCHAL TYPE OF ENGINE

History has it that all pioneers were poorly treated, and in this one American trail-blazer named Brayton was no exception. Brayton was, however, always given credit for the fundamental work which he did in connection with the development of a new type of internal combustion engine. Now that much interest is being manifested in the efficiency of motors as well as in the larger question of fuels, the time for a revival of the type fathered by the Philadelphia inventor is as particularly well chosen as Brayton's own attempt was badly timed.

This form of engine, described somewhat in detail in this issue, as revived in an improved form, is likely to receive very good support from all those who have sought a more efficient, more flexible engine adapted to burn any kind of fuel and do so economically. In the constant pressure type of engine now given some notice, all these much-desired results are attained and, what is seldom the case, without a consequent sacrifice of something else. This holds unless the mere matter of number of parts be considered a positive detriment or come in the "sacrifice" class, which, to say the least, would be far-fetched.

When it is considered that the constant pressure engine, as constructed by Stiliz, is in addition self-starting, any possible objection which might be raised on the score of number of parts, loses force, for is not the ordinary engine, with the addition of a self-starting device (where that is possible) complicated and composed of many parts?

So it is that Stiliz, taking up Brayton's thirty-five-year-old engine, but with improvements of his own which make it a commercially feasible proposition, is due for all of the credit that usually goes to a pioneer with a meritorious or apparently worthy invention.

\* \* \*

## REVIVAL IN BLOCK TYPE OF MOTOR

Not infrequently it happens, in the introduction of something new and decidedly different, that the scorn and ignominy heaped upon the introducers is out of all proportion to the value of the device fostered. And not infrequently it also turns out, in conjunction with a change of this sort, that the merit recognized tardily by the original critics is ultimately adopted by them.

So it was with the style of engine in which the cylinders, two, three, four, or six in number, were cast in a unit. Formerly these were spoken of using the French phrase *en bloc*, but now it has been Americanized and we say the "block type." This type of engine was a prolific source of discussion from a year and a half to a year ago, following its adoption by the foremost French constructors. After much discussion and an endless amount of criticism, the subject was dropped under a blight, perhaps.

Now, one year later, it is a noticeable fact that all of the new-model, small-sized cars are so equipped. Not only this, but in the interim, many makers have quietly adopted the same form of construction, so that to-day the American makers, taken as a whole, present as many sterling examples of the block construction as do the originators of it, the French.

From the point of view of the man who buys a medium priced machine, the block construction representing the extreme of simplicity, means less sources of trouble and also lower first cost. By reducing the cost, this construction has placed the automobile within the reach of an increased number of people.

Considering the simplifications which this form allows and, in fact, fosters, it will be a great surprise if in the long run it does not displace the small-sized twin-cylinder casting, as well as the individual-cylinder type, so that ultimately for all motors of four-inch bore or less, the block casting will displace all others.

\* \* \*

## AND NOW THE YEAR'S BIG TOUR

Never before have the participants in the big annual tour of the A. A. A. been asked to travel such a distance, and this under rules more exacting than in any previous year. But it is with no doubt as to the outcome that the prediction is freely made that the 2,600-mile journey will redound to the reliability credit of the American automobile industry as a whole.

The territory traversed, with slight exception, will experience its first "Glidden tour," which means that thousands will gaze in wonder at the dust-covered cavalcade, and be impressed with the ability of the motor-driven vehicle, despite the inevitable dishevelment of the participants, for in the Middle West clothes count for less than wholesome manners and man's belief in mankind.

The Gliddenites of 1909 will have pleasant recollections to revive along with the memories of hardships and dusty roads, for the welcomes will be innumerable and genuine.



## SEPT. 6 AND 8 FOR LOWELL'S NATIONAL STOCK RACES

**L**OWELL, July 6—The dates and character of the national stock car races to be run on the Merrimac Valley course were practically decided last week when Chairman Hower of the A.A.A. contest board, President L. R. Speare, Harry Knights, Boston representative of the board, and Fred J. Wagner came here for a conference with President Heinze of the Lowell Automobile Club and others interested in the automobile carnival, and to inspect the course.

Monday, September 6—Labor Day—there will be a sweepstakes race with four classes at distances varying from 110 to 250 miles.

Wednesday, September 8, the race for large cars will be held at a distance of from 300 to 400 miles.

These are the dates now agreed upon and probably there will be no change. The exact distances will be settled a little later. A \$5,000 trophy will be offered for the Wednesday race and suitable trophies for the different classes in the sweepstakes event.

Chairman Hower was well pleased with the course and believes that the ten-mile circuit will provide some of the sportiest racing ever seen in America. Fred Wagner is confident that cars can be started easily at 30-second intervals, which will permit a field of 20 cars in each event. That both races will have plenty of entries the officials are certain, and they will include the fastest of American and foreign cars.

An elaborate special invitation to President Taft to attend the races has been prepared and will shortly be forwarded to him. It has been signed by the governor, lieutenant governor, president of the senate, speaker of the house, Congressman Ames of the Lowell district, Mayor Brown of Lowell, President Speare of the American Automobile Association, and President Heinze of the Lowell Automobile Club. It is thought that at the time of the races President Taft will be at his summer home in Beverly, and it is hoped that he may decide to accept the invitation to attend the national stock car events.

## QUAKERTOWN MAY INVITE FOREIGNERS TO COMPETE

**P**HILADELPHIA, July 2—The lack of entries which spoiled the Quaker City Motor Club's State-highway run to Pittsburgh and return, and which compelled the abandonment of its proposed 24-hour race and the substitution therefor of a one-day meet, has made that organization's contest committee wary to a degree. Both of those affairs, before their details had been made public, had been assured sufficient entries to make them successful. When the time came for a showdown two-thirds of the promised cars failed, for one reason or another, to materialize. Chairman Ross will take no chances on a similar throw-down for the club's second annual 200-mile Fairmount

Park stock chassis race, scheduled for October 7 next.

The contest committee originally decided—and, indeed, prefers—that the race should be limited to American built cars; but having in hand several bona fide foreign entries, Mr. Ross prefers not to refuse them until every home manufacturer shall have had a chance to come in. There is only room for a score of cars, and if, within a reasonable time, American builders have not sent in a sufficient number of entries to complete the list, the door will be thrown open to the foreigners.

The committee has sent out notices to all American manufacturers of fast cars to get in early.

## ACTIVELY PREPARING FOR ALGONQUIN'S CLIMB

**C**HICAGO, July 3—Sixteen events, five more than last year, are upon the program for the Chicago Motor Club's annual hill climb at Algonquin. This will be held August 5 and really consists of 32 events, for the affair is held on two hills—one in the morning, a standing start effort, and the other in the afternoon, when the cars tackle another grade with a flying start. Both hills count, however, in deciding the winners. Six of the classes will be decided under the Chicago Motor Club formula, in which the cylinder capacity is multiplied by the time, and that result divided by the weight of the car with driver. The classification is to be by piston area, the program adopted at yesterday's meeting of the contest board being as follows, subject of course to the action of the A.A.A. contest board, which has been asked for a sanction:

### DIVISION 1—HANDICAP

Class A—One or two-cylinder cars with piston area under 50 square inches.

Class B—Four or six-cylinder cars with piston area under 50 square inches.

Class C—Four or six-cylinder cars with piston area over 50 and under 65 square inches.

Class D—Four or six-cylinder cars with piston area over 65 and under 90 square inches.

Class E—Four or six-cylinder cars with piston area over 90 square inches.

### DIVISION 2

Class F—Free-for-all, open to motor buggies, wheels 36 inches or over, solid tires.

Class G—Free-for-all, open to electrics.

Class H—Western amateur handicap championship, for four or six-cylinder cars, winner to be decided by the club formula.

Class I—Amateur free-for-all, touring cars or roadsters of any power.

### DIVISION 3

Class J—Free-for-all, any type of stock car with piston area under 65 square inches.

Class K—Free-for-all, touring cars, five or seven-passenger, with piston area under 65 square inches.

Class L—Free-for-all, any type of stock car with piston area over 65 and under 90 square inches.

Class M—Free-for-all, touring cars, five or seven-passenger, with piston area over 65 and under 90 square inches.

Class N—Free-for-all, any type of stock car with piston area 90 square inches or over.

Class O—Free-for-all, touring cars, five or seven-passenger, with piston area 90 square inches or over.

No change has been made in the entry fee, it remaining at \$30 per car, with half of this sum refunded in case of a start. There must be at least three entries to a class to make a contest. The entries will close at midnight, July 30, with Charles P. Root, 1806 Michigan avenue.

## TOUR THROUGH NEW YORK'S LAKE REGION

ROCHESTER, N. Y., July 6—The touring committee of the Automobile Club of Rochester has made definite arrangements for the first annual tour. The committee is composed of W. W. Dake, chairman, A. J. Cunningham, R. A. Hagen, and President H. G. Strong and Secretary Bert Van Tuyle, ex-officio. The tour will start from the Hotel Seneca July 22, at 9 A.M. The route passes through some fine sections of the State, and nearly all of New York's inland lakes are touched in the trip. Secretary Van Tuyle will start July 8 on the pathfinding trip, and will be accompanied on the journey by Karl W. Hibbard.

## 1910 WINTON MARKED BY FOUR-SPEED TRANSMISSION

**A**S Mr. Winton himself has aptly put it, the Winton changes for 1910 are only incidental, not radical, barring the four-speed transmission and enlarged clutch. It has been found in the experience of the past and previous years that the engine was more powerful and had more speed than the high speed of the old transmission would allow the use of. So a new top gear has been added to the transmission to allow the owner, if he so desires, to turn the engine loose with the assurance that every possible turn of the crankshaft will be utilized in the speed of the car. Coupled with this change, there was a necessity for or advisability of a larger clutch than heretofore, which would handle the higher power and speed. So the diameter of the multiple disc clutch was enlarged 50 per cent. without changing the number of discs. A minor change was in the number of springs, the newer use of four allowing very slight foot pressure to engage or disengage the clutch.

While the motor remains exactly the same, superior fuel supply is attained by a newly perfected carbureter, located in practically the same place. This allows the full use of the flexibility of the six more than has hitherto been possible. The working parts are more closely enclosed, yet this is done without any sacrifice of accessibility.

Lubrication is unchanged, the force feed system with a continuous sight feed on the dash being retained. Similarly the successful self-starting device is retained. Now that much accent is being laid upon the starting problem, this is of particular importance. Pressure from the front cylinder is stored in a tank, whence a rotary distributing valve furnishes it to the proper cylinders in turn. The motor is started by pressing a foot button on the dash, the air pressure doing the rest. This whole system may be used for tire inflation by a simple attachment, thus doing away with the back-breaking work.

**Greater Comfort Assured by Larger Springs**—An item that never fails to interest is that of comfort. An increase in this is obtained by increasing the length of the springs, the style being the same as before. In addition to long, wide springs, four shock absorbers and four rubber bumpers are fitted.

One noticeable change, which may or may not be in the nature of an experiment, is the change in the material of the front axle. This has always been made of manganese bronze, but this coming year is to be of large section pressed steel. With the change in front axle, probably strengthening it, comes an increase in the wheel base. This has been increased to 124 inches, four more than previously.

To this chassis of greater length is fitted not a longer but a shorter body. In this way the maximum amount of comfort is obtained, as the various dimensions may be made as long or as great as possible. The regular body is the four or five passenger type, with bucket seats in front and a short tonneau in the rear. A seven-passenger body is made as an extra. The new tonneau doors are unusually wide. Running boards have been widened and are covered with pressed aluminum. All bodies are of wood, built especially to Winton designs.

In moving the main gasoline tank to the rear, a move for greater safety and increased convenience has been made. The three-gallon reserve feature which has become so popular will be retained. The main tank has a capacity of 22 gallons.

Other and minor features which have been subjected to change are: radiator with longer tubes, longer filler and hard rubber cap; hard rubber steering wheel rim, movement of operating levers nearer the seat as an option, longer spark and throttle levers, increased pedal leverage, with the option of long or short pedals; larger exhaust pipe and Eisemann dual ignition. With all these changes the price remains the same—\$3,000.

### WINTON BRANCH MANAGERS IN CONVENTION

CLEVELAND, July 3—Winton branch managers and road men enjoyed a busy convention here this week. There was something doing every minute from breakfast to good-night. Baseball, field sports, a yacht ride, a theatre party, and a trip to Luna Park were only part of the doings, which included every variety of luncheon and dinner except the formal kind. The participants were: Vice-President Henderson, Secretary Brown, Sales Manager Churchill, Advertising Manager Mears, Parts Manager Smith, Engineer Anderson, Traffic Manager Baughman, Superintendent Weidig, Purchasing Agent Ranney, and the following branch managers and road men: Messrs. Hinchcliffe, of Boston; Brown, of New York; Calvert, of New Jersey; Maltby, of Philadelphia; Stockbridge, of Pennsylvania; Duck, of Baltimore; Kiser, of Pittsburg; Brockway, Sealand and Walley, of Cleveland; Henderson and McCrea, of Detroit; Davis and Roe, of Chicago; Johnson, of Minneapolis; Lewis, of Kansas City; Miller, of Seattle, and Owsney and Arbuckle, of San Francisco.

### STEVENS-DURYEA GIFT FOR QUEBEC PREMIER

MONTREAL, July 5—Sir Lomer Gouin, premier of the Province of Quebec, has been presented with a six-cylinder Stevens-Duryea touring car by a number of his friends, as a mark of their esteem. The ceremony partook of the nature of a surprise at the St. Denis Club, while the big automobile stood nearby, and later in a trial showed the premier that it was well able to carry him up the hills of the city. Alderman Lavaller on behalf of his colleagues made the presentation address. The car was sold by Managing-director L. D. Robertson of the Comet Motor Company, local distributor of the Stevens-Duryea.

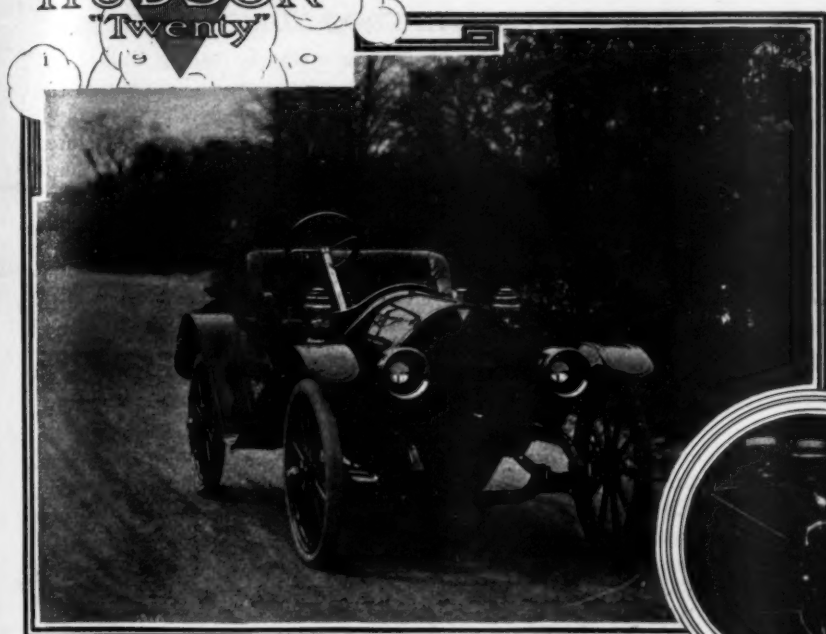
### PREPARATIONS FOR THE GARDEN SHOW

NEW YORK, July 5—While most automobilists who attend the annual shows in this city have not given the 1910 ones more than a passing thought, there are two bodies of men which are preparing for the great exhibitions already. For the tenth national show at Madison Square Garden, that of the Licensed Association of Automobile Manufacturers, active work is now going on. Contracts are being let, plans are practically all completed, and even the manufacturers are beginning to arrange for the machines which will compose their exhibits. The activity of the show committee, made up of Col. George Pope, of the Pope Company, chairman; Charles Clifton, of the Pierce-Arrow Motor Company, and E. P. Chalfant, of the Packard Company, has been of several months' duration.

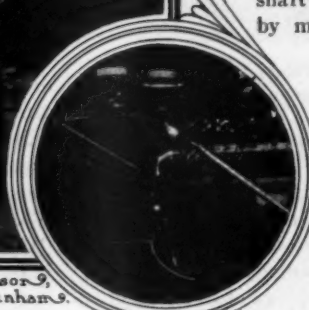
Scores of carloads of lumber, special sheet and structural steel, burlaps, bunting, and other materials have already been ordered, and some are being manufactured. These will be used in constructing the balconies, which will be larger than usual, and for covering the walls and floors. The committee has succeeded in developing additional floor space this year, much to the wonderment of those interested, by increasing the width of the balconies. The elevated platform, which has been a feature for some years at the Seldenite exhibition, will be supported by a single series of posts, enhancing the artistic value as well as giving the necessary room, and will extend around the whole auditorium. The various corners and small rooms of the great building will be utilized as formerly, for accessory, motorcycle and commercial vehicle makers.

From the present indications the manufacturers will all have their new models ready well in advance. Some are even now preparing the cars which will be exhibited, and some wonderfully beautiful body designs are well under way.





President J. L. Hudson,  
Chief-Engineer Dunham.



**Preference Given to Long Stroke**—In the length of the stroke,  $4\frac{1}{2}$  inches, is shown another very modern tendency, the preference for the long stroke, slow speed engine. This gives for this car a ratio of bore to stroke of 1.2, which should make for strong pulling power at comparatively low speeds. Although the A. L. A. M. rating formula would allow of calling this sized engine a 22.5 horsepower unit, the makers have preferred to give it a lower more conservative rating and so call it a twenty.

The aluminum crank-case is in two parts, the upper carrying the two large plain crank-shaft bearings, and being attached to the frame by means of four large section arms. The shaft is of large diameter, made from a high grade material, having a tensile strength of 100,000 pounds, and is ground to size. Not only the crank-shaft, but the camshaft, cams, pistons, piston pins, valves, and many other parts are subjected to the grinding process to insure accuracy.

Engine lubrication is of the forced circulation splash type. An oil well of three quarts capacity is cast integral

with the lower half of the crank-case, with a simple plunger pump, operating by an eccentric on the camshaft, raising oil from the well and forcing it directly to the parts.

By utilizing a carbureter of the Venturi tube variety, with ball auxiliary valves, the up-to-dateness which pervades the whole car is maintained. Ignition is by means of battery and timer, the latter, of the La Coste type, being independently supported at the rear end of the camshaft. From the engine the drive is through a large diameter cone clutch, faced with leather. Under this facing a series of flat springs make for easy and gradual engagement. The clutch thrust is well taken care of by a large ball thrust bearing.

**First Small Car with Three-Speed Selective Transmission**—Being accustomed to think of small cars as fitted with a planetary transmission, it comes as a surprise to learn that this car is equipped with a three-speed and reverse-gear box, operating on the selective principle. Like the engine, this is mounted in a two-piece aluminum gear-case, supported upon four large arms. The transmission bearings are also plain, and are provided with oil retainer chambers on the ends.

Both engine and transmission are secured to a sub-frame of the dropped type, which is made a part of the main frame. The latter is of pressed steel, the material being best open-hearth stock, with a  $3\frac{1}{2}$  by  $1\frac{1}{2}$ -inch section.

The frame has what is called a drop at the rear of  $2\frac{1}{2}$  inches, this allowing the car to be hung low and at the same time have adequate clearance. With this drop frame is used three-quarter elliptic springs,  $1\frac{3}{4}$  inches wide by 44 inches in length. With these, the front springs of 36-inch length are fitting companions.

An I-beam section front axle and a semi-floating rear axle complete the chassis, both being mounted on roller bearings.

**Double Acting Brakes on Rear Wheels**—Braking, always important, whether the car be large or small, is here well cared for by two large double-acting brakes located on the rear axles and acting on the interior and exterior of large diameter drums bolted to the rear wheels. The external brakes are firmly supported on brackets, which prevent rattle. Both brakes work equally well in either direction, and both are lined with a heat-proof asbestos fabric, which is readily removable.

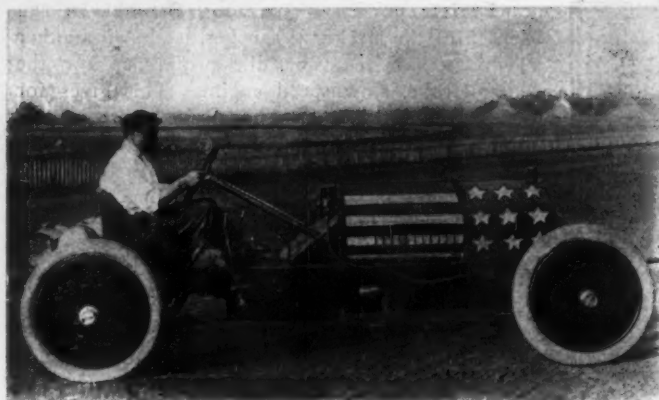
Steering is by means of a gear of the worm and gear type, mounted upon exceptionally large bearings. The steering post is laid over at an exceptional angle affording a very racy appearance and placing the sixteen-inch steering wheel in a very comfortable position for the driver. The control aside from this is standard in that it follows the regular practice of standard cars.

**SURPRISING** as have been the car announcements of the past few weeks, none has excited the comment as has the announcement of the new car to emanate from Detroit, the Hudson "Twenty," by name. This will present in a concrete form all of the ideas in small car construction gained in the past season, and from a manufacturing standpoint will embody the results of twelve years of automobile construction knowledge. Starting with a staff of old experienced automobile men, concentrating its attention on a single model, and going in for a very large production, many economies are thus brought about, with the result which has aroused the automobile world, the price being but \$900. This, with a Bosch magneto, top, gas tank, and extra rumble seat, being increased to \$1,050.

Of the men behind this new car, most are well known in the industry, with the possible exception of the president, J. L. Hudson, one of Detroit's leading merchants. Of the others, Hugh Chalmers is president of the Chalmers-Detroit Motor Company. So, too, R. D. Chapin and H. E. Coffin are connected with the Chalmers company, while R. B. Jackson, general manager, and G. W. Dunham, chief engineer, both served many years with the Oldsmobile manufacturers.

**Personnel Reflected in the Product**—With such a motor-wise bunch "on the job," it is not strange to find the product so meritorious. From the front to the rear of the chassis, every part has been carefully considered both for its individual ability and serviceability, and for its interrelation with every other part. Starting with the standard body, which is furnished for the single chassis to be manufactured, this is of the roadster type, with full front seat and single rumble in the rear. It is well made of selected poplar on sills of the best ash, the seat backs being poplar also. The large and roomy seats are upholstered in apple green, while the main color is a deep maroon. To set this off best, a fine stripe of old ivory is used, and black mouldings. With the maroon, black upholstery may be had, while with the green trimming, battleship gray will be furnished, if preferred by the prospective purchaser.

Taking up the real, beating, pulsating heart of the car first, the engine, this is of the four-cylinder variety, with cylinders cast in a block. In this, it follows the most modern and approved practice in small motors. The motor is of the T head type, with valves all on the right side, as used by the famous French constructor, Renault, until it is now called the Renault type. The cylinders, with  $3\frac{3}{4}$ -inch bore, are of the best grade of gray iron, with water space between the cylinders and of a very generous size around the exterior and at the ends.



Barney Oldfield in His New National Racer, "Old Glory"

## PLAINFIELD HAS FIRST HILL CLIMB

PLAINFIELD, N. J., July 6—Charter Day celebration was featured to-day by a hill climbing contest on Johnston's drive, over a distance of seven-tenths of a mile, with nine difficult turns, and an average grade of 15 per cent. There were six events on the list and there were sufficient entries, and good ones, to give a successful affair. One mishap occurred to a National car which was driven by George Weldon, accompanied by William Bolen. They were just making the last hairpin turn within a few yards of the finish, in the free-for-all, when a wheel struck a wooden culvert, the car turned turtle and went over an embankment. Both men were thrown clear, but Bolen's shoulder was fractured.

J. R. Rutherford in a Stearns and George Rankin in a Chalmers-Detroit have equal claims upon the fastest time of the day, 1:28, made in two separate classes. A four-cylinder Maxwell, driven by William Sichinger, came close to this by winning a class event in 1:28½. The event was in charge of F. J. Titus. The summaries:

CARS SELLING FROM \$2,001 TO \$3,000				
Pos.	Car	H.P.	Driver	Time
1	Chalmers-Detroit	40	George Rankin	1:29 2-5
2	Palmer-Singer	60	F. C. Lescault	
3	National	35	George Weldon	
CARS SELLING FROM \$1,251 TO \$2,000				
1	Marion	35	Charles Stutz	1:36 4-5
2	Herreshoff	24	George Robertson	
3	Buick	30	C. S. Dutcher	
CARS SELLING FROM \$851 TO \$1,250				
1	Buick	18	Easter	1:44
2	Overland	30	George Reese	
CARS SELLING FOR \$850 OR LESS				
1	Maxwell	22	William Sichinger	1:28 1-2
2	Maxwell	22	Arthur See	
3	Hupmobile	16	K. D. Martin	
FREE-FOR-ALL				
1	Stearns	30	J. H. Rutherford	1:28
2	Chalmers-Detroit	40	George Rankin	
3	Simplex	50	W. Heitmeyer	
WINNERS' CLASS				
1	Chalmers-Detroit	40	George Rankin	1:28
2	Maxwell	22	William Sichinger	

## CABLES CREDENTIALS TO CHAIRMAN EVANS

NEW YORK, July 3—Powell Evans, in representing the A.A.A. at the London convention of the League Internationale Association des Tourists, will also be the real official delegate of the United States. Because of a hurried departure the necessary credentials on behalf of the government were not obtainable, but this week these were cabled to Mr. Evans from Washington. Secretary Elliott of the national body and Secretary S. Boyer Davis of the Automobile Club of Philadelphia had a conference early in the week with Vice-President Sherman, Secretary of State Knox, and Attorney-General Wickersham relative to the official recognition, and the cable message was the result.

## REGAL EN ROUTE FROM YORK TO 'FRISCO

NEW YORK, July 5—At exactly noon the sturdy little four-cylinder Regal started from Times Square on its long trip to the Pacific Coast. Fireworks were intermittently sputtering, though one of the usually busiest places in the "big town" was tenanted by only a few unfortunates who had failed to escape to some resort or other. It so happened that the weather was exceptionally inviting and ideal for the beginning of a long automobile tour.

"Snow Ball Bill" Smith was at the wheel, with George D. Wilcox alongside as the route scout, while comfortably seated in the tonneau were Marcus Allen of the Empire Tire Company, Trenton, N. J., and R. P. Byrne of the Regal Sales Company, Syracuse, N. Y. These two will be replaced by others later on.

This is the first trip of its kind in trying out a new four-cylinder model of the \$1,250 class, and the route has been so arranged as to visit all the Regal agents from coast to coast. No record-breaking schedule has been prepared, but the trip will be comfortably covered in 30 days, this being the itinerary as at present laid out:

New York, N. Y.	July 5	North Platte	Night July 18
Poughkeepsie, N. Y.	" 6	Sterling, Col.	" " 19
Utica, N. Y.	" 6	Denver, Col.	" " 20
Syracuse, N. Y.	Noon " 7	Cheyenne, Wyo.	" " 21
Rochester, N. Y.	" 7	Rawlins, Wyo.	" " 22
Buffalo, N. Y.	Noon " 8	Rock Springs, Wyo.	" " 23
Erle, Pa.	Night " 8	Evenston, Wyo.	" " 24
Cleveland, Ohio	Noon " 9	Ogden, Utah	" " 25
Toledo, Ohio	Night " 9	Kelton, Nev.	" " 26
Detroit, Mich.	" 10	Montello, Nev.	" " 27
Goshen, Ind.	" 11	Battle Mountain, Nev.	" " 28
South Bend, Ind.	Noon " 12	Mill City, Nev.	" " 29
Chicago	Night " 12	Hazen, Nev.	" " 30
Clinton, Ia.	" 13	Reno, Nev.	" " 31
Cedar Rapids, Ia.	" 14	Colfax, Cal.	Aug. 1
Carroll, Ia.	" 15	Sacramento, Cal.	" 2
Omaha, Neb.	" 16	San Francisco, Cal.	" 3
Grand Island	" 17		

Columbus, Ohio.—F. E. Avery is having plans prepared for a two-story addition, 65 by 127 feet, to his garage on Franklin avenue, between Champion and Wilson avenues. The floors will be of concrete and the exterior of brick.



The Packard Motor Car Company's Powers That Be

One cylinder of the new 3,000-horsepower engine that will supply the motive power for the Packard factory, at Detroit, and President H. B. Joy, General Manager S. D. Waldon, Manufacturing Manager C. J. Moore, and Chief Engineer Russell Huff.



### NEW COLUMBIA COMPANY NOW A REALITY

HARTFORD, CONN., July 3—With the conclusion this week of the necessary formalities attendant upon the organization of the Columbia Motor Car Company, a famous automobile concern passed out of existence. It was the Electric Vehicle Company of this city, which had manufactured Columbia cars for years, held the Selden patent rights, and had been in the hands of the receivers since December 10, 1907. The entire assets of the now extinct concern, except cash in the hands of the receivers, have been transferred to the new one, and the production of Columbia cars will proceed with increased vigor. The following are the officers chosen: President, Herbert Lloyd, president of the Electric Storage Battery Company of Philadelphia; vice-president, treasurer, and general manager, Henry W. Nuckols, of Hartford, one of the receivers. The directors are Herbert Lloyd, Walter G. Henderson of Philadelphia, Henry W. Nuckols, William Hooker Atwood of New Haven, and Kenneth B. Schley of New York.

The change was made this week and the policies proposed for the coming season announced. A six-cylinder car will be added to the present line of gasoline cars, and both the output of these and of electric machines will be materially increased. The 1910 models are now in the process of building and will soon be ready for delivery. The same method of distributing—through agents—will be followed. The capitalization of the Columbia Motor Car Company has been increased from \$48,000 to \$3,000,000, divided into 30,000 shares. The receivers, Mr. Nuckols and Halsey M. Barrett of Elizabeth, N. J., have not been discharged by the court, and are now engaged in paying the 20 per cent dividend of the old firm's creditors.

### CHANGES IN HERRESHOFF MOTOR COMPANY

DETROIT, July 5—Certain changes are impending in the organization and control of the Herreshoff Motor Company of this city. While not as yet completed it is understood that the rearrangement is made with a view to a better co-ordination between the factory and the Harry S. Hought Company, the sales organization. The stock of the factory has until the present been held mainly by Charles F. Herreshoff and Louis Mendelssohn, but large blocks of this have been purchased by other interests. Mr. Herreshoff will remain as vice-president and chief designer, but the other officers have not been chosen. The Harry S. Hought Company of New York retains the entire selling control and it is expected by both parties that the new disposition will be of material benefit. The output of the plant has been increased, and, it is stated, it will work at its full capacity throughout the Summer to supply the demand.

### TO APPREHEND JOY RIDERS

PHILADELPHIA, June 7—Determined to bring the "joy rider" to book with a round turn, a number of prominent Quaker City Motor Club members, in conjunction with a well-known local detective agency, have formed the Auto Reporting Company, Inc., with main offices at 838 Real Estate Trust Building. L. D. Berger is president of the new company; Charles J. Swain, vice-president; Frank J. Curran, secretary and treasurer; G. Douglas Bartlett, the club's law committee chairman, is counsel, and Charles D. Sell, a prominent local detective, is the general manager; these, with George M. Costello, Thomas J. Curley and Howard W. Frame, compose the board of directors. The car of each subscriber will carry the company's emblem.

### R. D. CHAPIN ABOUT TO VISIT EUROPE

R. D. Chapin, treasurer and general manager of the Chalmers-Detroit Motor Co., will sail for Europe the middle of July to spend the Summer and return in September. He expects to visit England, France, Germany, and Italy.

"Of course, I know that now one does not have to go to Europe to see good automobile races," said Mr. Chapin. "This trip is not simply for the purpose of seeing the automobile races and studying progress in aeronautics, although I shall take in a number of the big events as long as I am on the ground. I will be particularly interested in watching the speed results the foreigners are able to get with their small cars. There is no question in my mind but what the light car races held in this country have resulted in developing unusual horsepower efficiency from small bore and stroke motors."

### WALTON HAS NO INTENTION OF CHANGING

H. E. Walton, manager of the Midland Motor Company, Moline, Ill., sends word to THE AUTOMOBILE that he has no intention whatever of leaving his present position and taking one with the automobile department of the St. Louis Car Company. In the news which Alfred Reeves supplied after his round of the A.M.C.M.A. factories it was stated that Mr. Walton was the general manager of the St. Louis Company's automobile department. Mr. Walton wishes it positively stated that he is perfectly satisfied with present conditions.

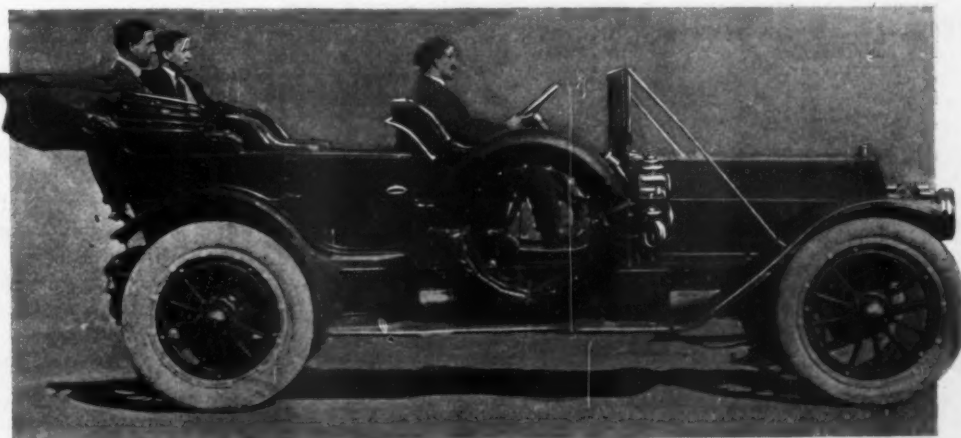
### "PEERLESS" KITTREDGE SAILS FOR EUROPE

NEW YORK, July 2—L. H. Kittredge, president of the Peerless Motor Car Company, of Cleveland, sailed for Europe this morning on the Kaiserin Augusta Victoria. He took with him a 1910 Peerless touring car, and will use it extensively on the Continent. He expects to make the trip one of combined business and pleasure, and will be away about 60 days.

### GENERAL MOTORS PROPOSES TO CADILLAC

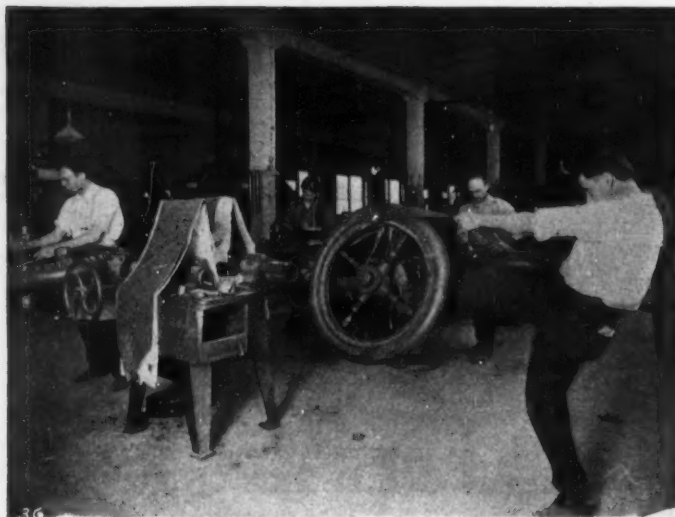
DETROIT, July 6.—With a view to enlarging the scope of its activities, the General Motors Company has submitted a proposition to the Cadillac Motor Car Company. Officials of the Cadillac company admit that the proposition is under consideration, but negotiations have not been made public.

**Battle Creek, Mich.**—Plans for a new garage for Howard B. Sherman, to be built on Maple street, have been completed and the contract let. The structure will be of the bungalow style of architecture.



How the Largest Flisk Tires Appear on the Largest Stearns Car

The Flisk Rubber Company claims to have made the largest pneumatic tires ever built for an automobile. This photograph shows a 90-horsepower six-cylinder Stearns touring car fitted with Flisk tires and Flisk removable rims. The front tires are 40 by 5-inch ones, and the rear 40 by 6. These are made in a growing use of larger tires.



Old Way of Stretching the Fabric on the Core by Hand

### TIRE MAKING BY MACHINERY

AKRON, O., July 3—For a number of years the Goodyear Tire and Rubber Company has been working to perfect a tire making machine that would turn out the right kind of Goodyear tires, and now has several machines in operation at the big plant in this city. In the old way of making tires by hand, they have been built up, first by a layer of fabric, then a layer of rubber, then another layer of fabric, and so on until the body of the tire was complete. As this fabric has always had to be stretched on by hand, by operatives skilled in tire making, the durability and longevity of a tire had been largely dependent on the skill and strength of the workman who made it.

To give the greatest mileage this fabric must be stretched to an absolutely even tension over each portion of the tire, and each alternate layer must be given the same tension as those that have previously been put on. It is self evident that this evenness of tension could not be faultlessly given when human hands were solely depended upon, and for instance, tires made in the morning, when a man is fresh, will be apt to be stretched more tightly and evenly than those made later in the day when the operator's muscles have become weary.

By the use of machinery for stretching the fabric a positively even tension is secured upon each strip of fabric used in a tire, and the Goodyear machines, shown in the illustrations, represent a marked step in advance in perfect tire making. The pictures are interesting to all users of pneumatic tires, and show both the hand and machinery methods.



How the Goodyear Tire Machine Stretches the Fabric

### CARTERCAR WITH INTERESTING HISTORY

PONTIAC, MICH., July 3—Often interesting things are told, and wonderful feats are accomplished, with automobiles, but "What becomes of them after that?" is the question which is raised by R. A. Palmer of the Cartercar Company. This query was brought about by an incident which happened in connection with the Chicago agency of the company.

The twentieth car which was turned out by the Cartercar Company was sent to Hagmann & Hammerly who, like everyone else at that time, were skeptical about the friction drive which is a distinguishing feature of the Cartercar. They therefore drove the car over 800 miles through sticky Illinois mud, it being so thick on the car that the shape was all that was visible. But that was only a beginning. The machine was then put into demonstrating service. It was entered in the Chicago Automobile Club's reliability run and made a perfect score in 1906. After covering over 14,000 miles it was again entered in 1907 and took another perfect score. But that wasn't all.

After having covered a total of over 23,000 miles it was sold to H. B. Walker of Chicago. Mr. Walker now states that he drove the machine something like 4,000 miles more last season, and adds that although it has covered over 27,000 miles, it would require more than \$1,000 to buy the car now.



Machine Rolling Fabric Down After It is Stretched

### GROUT COMPANY IS REORGANIZED

ORANGE, MASS., July 6—A new company, chartered in this State with a capital of \$150,000, known as the Grout Automobile Company, will take over the Grout Brothers Automobile Company, as a reorganized concern. The receivers of the old company will transfer the business, confident that it will be carried on even more successfully than during the recent months. The officers of the Grout Company are: President, Walter J. Gould; treasurer, E. S. Hall; secretary, George E. Dexter; and these also constitute the board of directors. The plant is well equipped for manufacturing automobiles and is capable of producing two a day. Judge Hall has had two years' experience with the factory as one of the receivers; Mr. Gould was selling agent of the former company; and Mr. Dexter is the secretary of the Chase Turbine Company, thus forming a trio well acquainted with successful manufacturing conditions.

**Auto Carries Fresh Milk for Babies**—The Columbus District Nursing Association is now operating a large automobile to carry fresh milk to the hundreds of babies in Ohio's capital city. The car is equipped similarly to a refrigerator freight car.





Koenig Brothers' Garage at Tarrytown, N. Y.—A Model of Its Type

#### WELL-KNOWN GARAGE ON HISTORIC GROUND

TARRYTOWN, N. Y., July 5—While the firm of Koenig Brothers, Rambler representatives at Tarrytown, has been doing business at the Old Post Road Garage for several years, it held quite a celebration recently to inaugurate its new and up-to-date garage. This is located in a historic country, alongside of what was, and still is called the Old Post Road, its name dating back several hundred years, to the times when the mail was carried by four-horse mail and passenger 'buses, called post-chaises. From the use of this road exclusively by the post 'buses came the name Post Road, which has been retained through all these years.

The garage is now housed in a new two-story, fire-proof building of reinforced concrete. The ground floor, 50 x 85, will be devoted exclusively to storage, sales and locker rooms. The latter are for the convenience of owners, not employees. When a car is brought in, it is first searched, and anything found therein is placed in the owner's locker, the garage and owner having duplicate keys. The second floor is arranged for a ladies' parlor and chauffeurs' quarters, a part of the latter space being a lecture room, in which is conducted an automobile school.

Complete describes the repair shop, located in the well-lighted basement. Aside from tools for doing all manner of repair work, there is a tire repairing outfit, consisting of tube and sectional vulcanizers, recovering plant, etc. A pair of mercury arc converters supply the necessary changes in electric current for charging storage cells in electric vehicles, and for ignition batteries as well, the two being kept separate for these uses.

On the occasion of the recent celebration, prizes were given to the first five automobiles arriving from New York City in a run organized for the occasion.

#### BRIEF GARAGE NOTES THE COUNTRY OVER

**Milton, Pa.**—The Ritter Company, an enterprising firm, has opened a garage here, well equipped and managed by experts. It is located at the corner of Arch and Second streets, 64 by 66 feet in size, with front and rear entrances, machine shop, wash stands, underground gasoline storage, etc. The agency for the Jackson, E-M-F and Locomobile cars, as well as numerous sundries, is held. The members of the concern are: E. E. Ritter, who built the first automobile owned in the section, thirteen years ago, which is

still in use; Thomas E. Spangler, a local business man, and W. H. Hackenberg, an attorney. The company is a Pennsylvania corporation.

**Fond Du Lac, Wis.**—The common council of Fond Du Lac has passed an ordinance requiring all garages to be made fireproof, present buildings rebuilt and new ones according to code. It was at first decided to condemn all garages in the business section, but this met with too strong opposition. The ordinance is the result of a recent \$250,000 conflagration which is thought to have been started in a garage.

**Petersburg, Va.**—Plans have been completed for the erection of a fireproof garage for the Stratton & Bragg Company, on its lot on Union street, near Washington. The building will be 60x100 ft. in size, constructed entirely of concrete, brick and steel, and will be fully equipped for the garage and automobile sales business. The

company also intends to build on the lot next to the garage a modern and complete brick and steel machine shop, and to install the best machinery. A traveling crane will be a valuable facility.

**Fort Worth, Tex.**—The Reid Auto Company has found it necessary to build an addition to its quarters at Rusk and Eighth streets, and work has commenced upon an additional story, which will give 9,500 square feet of floor space. Four taxicabs have been ordered and are now en route from the factory.

**Springfield, Ill.**—Glenn D. Smith is building a thoroughly modern garage at 413-415 South Fourth street, in connection with an apartment house, the latter occupying the front. The garage will be 60 by 80 feet in size, constructed of brick and stone, and fitted with a complete machine shop.

**St. Louis.**—The Albert Sterne Motor Car Company has received permission to construct a large garage building on Olive street, west of Sarah street, with a 50-foot front and 155-foot depth. The plans show that it will be one of the most complete in the city.

**Bucyrus, O.**—The Bucyrus Cycle and Automobile Company garage has changed hands, Frank B. Lauck succeeding John Eberhard and son in proprietorship. They will have the agency for the Mitchell and Maxwell cars.

**Fond du Lac, Wis.**—Popularity of garage building has been shown in the receipt of ten bids for the construction of the Anderson garage, at the corner of West Second and Macy streets. One of \$4,235 will probably be accepted.

**Binghamton, N. Y.**—Ellis W. Morse & Company, agent for the Overland cars, is planning to erect a handsome garage, including salesrooms and other conveniences. Several sites are now under consideration.

**Vincennes, Ind.**—The Johnson Auto Company has leased the old Coliseum building, and will turn it into a garage, first putting in a new front, and then making other decided improvements. A long term lease has been taken.

**Los Angeles, Cal.**—W. P. Bosbysell, the local agent for the Dorris car, is erecting a new garage on South Olive street, and expects to occupy it within a few weeks.

**Wilkesburg, Pa.**—The Co-Operative Automobile Company has opened a garage at 605 South avenue in addition to the agency for the Moline cars.

# Told in the Progress of the Industry

**New York Sporting Goods Company Enlarges Quarters**—Owing to a largely increasing business in automobile supplies and camp equipment, the New York Sporting Goods Company has had to enlarge its store. The present location at 17 Warren street has been increased by the addition of the store next door at 15 Warren street, with connecting archways. The automobile and bicycle supplies will be sold upon the ground floor, and the shipping facilities doubled by the use of another basement. Tents and camping outfits will be moved from the third to the second floor and the entire third used for offices. The remaining floors are for storage and repair shops. This company is now in its twelfth year, and its business has grown from a very small one to one with five departments. Each of these has a separate manager, whose accounts are individual, so that the officers can always tell how each one is being run. A large mail order trade has been built up recently.

**Blue Most Popular in Pierce-Arrow Colors**—The Pierce-Arrow Motor Company has recently had a table prepared to show the color schemes most chosen by purchasers of those cars. Some surprises appeared, especially for those who like to refer to automobiles as "big red ones," and for purposes of comparison the shades were not taken into account. The following is the ranking discovered: Blue, 26.57 per cent; green, 25.04; wine, 21.14; red, 10.88; brown, 6.66; gray, 4.60; black, 1.75; white, 0.31; lead coat only 2.88. The blue received its lead principally in the smaller cars, such as those of 24, 36 and 40-horsepower; while in the 48 and 60-horsepower models green prevailed. For the coming season Pierce-Arrow dealers will have choices from 32 sets of colors.

**Fire Inconveniences Kemizite Manufacturers**—The office, accounting department and retail salesroom of the Auto Tire Security Company, at 1231 Michigan avenue, Chicago, were slightly damaged by fire on June 30. The actual loss is reported as trivial and the retail department was doing business in a garage three hours after the occurrence. The wholesale department is temporarily located at 1221 Michigan avenue. No stock was lost and, according to the sales manager, C. L. Morgan, the manufacturing plant is intact and operating at full capacity.

**Model Company Increases Capitalization**—The Model Automobile Company, manufacturer of Great Western automobiles, has doubled its capitalization. The increase was entirely taken up by the present stockholders and none was offered for sale outside. It was decided at the same time to build two additional factory structures, which will give about 35,000 square feet more floor space than at present. Work will be commenced at once.

**Selden Company Buys More Ground**—The Selden Motor Vehicle Company, Rochester, N. Y., has purchased four acres of ground in Probert street, 650 feet long and extending between the New York Central and the Rochester,

Syracuse and Eastern railroads. The details of the new plant have not been made public, but it is understood that the ground will be broken at once.

**Portable, Not Portland**—Under the head of "Information for Auto Users," last week was described an excellent device for holding electric lights in any position desired, when working with them in the shop or garage. Unfortunately, an error made this appear to have the trade name of Portland, which is not the case, the name being the Portable Wash-Rack Light.

**Packard Company Has No Branches**—Recently a report was circulated to the effect that the Packard Company would open a branch in Albany, N. Y., but this was confused with the opening of a new garage and sales establishment by the agent in that section, J. A. P. Ketchum. The Packard Company, when asked about this, stated that it has no branches.

**Taxicab Factory in Memphis**—The Corbitt Taxicab Company has been formed in Memphis, Tenn., to manufacture and operate taxicabs. A new factory will be obtained to employ 200 men. The cars will be of conventional type.

## NEW DIAMOND DEMOUNTABLE

Carrying extra tires inflated and ready to run, a new demountable rim has been developed by the Diamond Rubber Company, of Akron, O. The rim has just been placed on the market and will have a conspicuous place in the Diamond products for 1910. In design and construction it is both simple and strong and permits the removal of the damaged tire with the application of a fresh one, pumped up and ready for running, in scarcely more time than is required to jack up the wheel.

A notable improvement over the Diamond 1909 demountable equipment is the fact that the rim can be fitted to any automobile wheel felloe of regulation

construction without material alteration of the same. No machine work is necessary on the wheel band or elsewhere and any competent blacksmith can, the Diamond Rubber Company states, do the job properly and inexpensively. A further improvement eliminates the necessity of mortising out the felloe to admit the valve stem of the inner tube. A series of wedges fitting between the wheel band and the rim itself take up all possible play and make the fit tight and secure. For the same reason small irregularities, due to dinging of rim or band or other causes, cannot interfere with the rim's quick and easy operation.

The new Diamond demountable will accommodate any standard make of regular clincher tire. The Diamond Company has spent much time and energy in developing and testing this new product and the vigor with which the rim is being pushed is plainly indicative of the company's own confidence therein.

## IN AND ABOUT THE AGENCIES

**Times Square Branch in Kansas City**—Jesse Froelich, of the Times Square Automobile Company of New York, and managing director of the Benz Auto Import Company, has established a branch of the Times Square Company in Kansas City, Mo. As in New York, Chicago and St. Louis, this new branch will handle second-hand automobiles for the Western and Southwestern territory. A site was chosen at Seventeenth and Main streets, and the business will be commenced at an early date.

**Maxwell, Philadelphia**—The Maxwell output will hereafter be represented in the Quaker City by a factory branch house. The Longstreth Motor Car Company, the local agent, last week transferred its affairs to the Maxwell-Briscoe Motor Company by mutual consent. William F. Smith, general manager of Maxwell district No. 3, will have complete charge of the retail business as well as the wholesale. The present quarters will be retained.

**Empire Opens Philadelphia Branch**—The Empire Tire Company announces the opening of a branch house in Philadelphia at 322 North Broad street, on Automobile Row. It will be in charge of E. B. Richardson, who in the past has represented the company in the capacity of general salesman.

## RECENT BUSINESS CHANGES

**Spare Motor Wheel Company Moves Offices**—The Spare Motor Wheel Company of America, Limited, has moved its general offices to the factory in St. Anne, Ill., from 236 Michigan avenue, Chicago. The company has taken up the manufacture of standard clincher automobile and motorcycle rims, in addition to the Stepney spare wheels. It is making the Universal demountable rim for the Universal Rim Company of Chicago, and its own rims will be handled through the American Distributing Company of Indianapolis.



Diamond Demountable Rim



## PERSONAL TRADE MENTION

**Charles Ethan Davis** has been appointed the general manager of the Warner Gear Company, of Muncie, Ind. He was formerly with the American Locomotive Company at Providence, R. I., and will take up his new work in the West on August 1.

**Ernest L. Smith**, of Detroit, has been made sales manager of the Grant-Lee Machine Company of Cleveland. Mr. Smith was formerly Western representative of the Standard Roller Bearing Company.

**James E. Murray**, manager of the automobile department of the New York Sporting Goods Company, has left the city for a two months' vacation at his camp near Wolfboro, N. H.

## TAXICAB AND TRANSIT

**Decatur, Tex.**—To avoid a trip of 80 miles, via Fort Worth, to go 28 between Decatur and Denton, it is probable that an automobile line will be installed shortly. The traveling salesmen who enter this territory are particularly interested in the proposal and are seeking assistance from the Commercial Club of Decatur.

**Carleton, Mich.**—It is likely that an automobile bus line will be established between this town, Flat Rock and Rockwood, running on a schedule, and connecting with the Detroit, Monroe & Toledo electric line at Rockwood. Alexander Ropelle, of Detroit, is the promoter of the scheme.

## PACKARD EXPERTS CONVENE

**DETROIT, July 6**—Superintendents of the mechanical departments of Packard dealers throughout the country have been visiting the factory of the Packard Motor Car Company for the past two weeks. Meetings have been held daily at which all mechanical features of Packard 1910 cars have been discussed as well as the general conduct of Packard repair work and shop service for owners. The visitors also have spent much time in the factory studying Packard methods of construction and the actual manufacture of the new models. There has been road work in new cars, and the social side of the conventions has taken the form of drives into the country for frog-and-chicken dinners seasoned with shop talk and suggestions for future improvement.

At some of the meetings the executive, engineering, factory, sales and technical heads of the Packard Company have held lively discussions with the visiting experts, thus presenting all features of car design, construction and maintenance from many points of view. In fact, the meetings have been so notably successful that they will probably be made annual affairs.

Most of the Packard dealers' superintendents were taught their business in the Packard factory. It is one of the most important parts of the Packard policy to give efficient service to owners everywhere.

## RECENT INCORPORATIONS

**Flexible Aeroplane Company**, Newark, N. J.—Capital, \$100,000. To manufacture aeroplanes, automobiles, etc., etc. Incorporators: J. Formanns, J. K. Murgatroyd, H. Taylorson.

**Eastern Auto Transit Company**, Albany, N. Y.—Capital, \$35,000. To operate stage

line between Albany and Schenectady. Incorporators: W. A. Cryne, E. D. Wintersteen, C. B. Henry.

**Badger Motor Car Company**, Columbus, O.—Capital, \$100,000. Incorporators: E. W. Arbogart, W. C. Leitsch, George C. Holtz, A. M. Bellack, E. M. Poser.

**Barber Auto-Cab & Repair Company**, Brooklyn, N. Y.—Capital, \$15,000. To manufacture automobiles, etc. Incorporators: A. S. Barber, R. A. Rendich, William Barber.

## RECENT PUBLICATIONS

**Ferro Machine and Foundry Company**, "Marine Gasoline Engines and Equipment"—This differs from the ordinary catalogue in many ways. Fundamentally it is a treatise on the correct design, construction, installation and operation of power boats. Being intended primarily for the man who is not a mechanic, it is written in simple, non-technical language. The first edition was issued in 1907, and the present work is that brought up to date by the additions of last year and the more important ones included within the covers for 1909. After some pages of general information on principles and historical review the details are taken up in order, beginning with the carbureter. Ignition and mechanical parts follow in order, much space being devoted to a praiseworthy attempt to elucidate the mysteries of the former. After that considerable mention is made of the shop processes, this being of value to the purchaser in that he ought to know of the painstaking care necessary to produce the ultimate result, the finished motor. The illustrations throughout are very complete and well done.

**American Manganese Bronze Company**, Holmesburg, Pa.—This is a small folder descriptive of the company's product which consists of bronze and allied metals. The principal product to which most of the folder is given up is manganese bronze, well known for its great strength, forgeability, ease of casting allowing complicated shapes to be cast of it, and bearing value which permits the use for bearings to a limited extent. The trade name of the metal is Spore's, and the guaranteed tensile strength is 75,000. A series of accurate test records is given in which the lowest figure reached therein is 81,500 pounds, and the highest going up to nearly 85,000 pounds.

In addition, a bearing metal of white bronze is made, this being a true bronze and not a babbitt metal. This combines with great strength a high melting point, and other valuable properties, fine anti-frictional properties. In fact, the makers are ready to promise and guarantee a coefficient of friction below .01 with properly fitted shafts and bearings.

**Vehicle Top & Supply Company**, St. Louis—Vesco tops for all kinds of automobiles are made by the Vehicle Top & Supply Company, of St. Louis, and illustrated in the

latest catalogue issued by this concern. Best known under the trade name of Vesco, these tops are made in several varieties of material and design. There are four kinds of fabrics named—Pantasote, Vesco, "Auto" rubber, and cravenette and mohair, with the advantages in respect to price of each compared and the quality described. The cravenette and mohair tops are the most expensive, with the Pantasote, Vesco, and "Auto" rubber ranging in that order. The details of lining are also described at length in regard to each style and price. The company also manufactures lines of tire covers, dust covers or hoods, lamp covers, wind shields, and makes a specialty of automobile body upholstery.

**G. H. Curtiss Manufacturing Company**, Hammondsport, N. Y.—Curtiss motorcycles of one, two and three cylinders are described in an interesting catalog just received. The details of the roller bearing motors, the trussed frame and fork construction, are considered, and the specifications of the five types given. Views of the flexible side car and of the rear seat attachments are shown. The single-cylinder models are fitted with 3 and 3½-horsepower engines; the two-cylinder machines with engines of 6 and 7-horsepower, and the three-cylinder, one with an engine of 10-horsepower, geared to give a speed of 20 miles per hour.

**Syracuse Rubber Company**, Syracuse, N. Y.—One of the most complete catalogues of automobile sundries published for the 1909 season has recently been issued by the Syracuse Rubber Company. In handy size for carrying in a pocket of an automobile, it may be used as a reference book, for practically everything in the accessory line has been listed. For the autoist who is equipping a new car or for the owner who desires new supplies the booklet will give prices and description of the various articles. Motor boat and yacht supplies are also given detailed attention.

**International Acheson Graphite Company**, Niagara Falls, N. Y.—A new folder just issued is known as 273 J. It is descriptive of their graphited greases, products which are designed for gear, cup and ball-bearing use. In the manufacture of their graphited grease this company uses the purest and best graphite. The graphite and grease are well blended, and it is claimed that the resultant product will show a tremendous amount of working force, great value being given the combination by the superior lubricating qualities of the graphite.

**Southwestern Automobile Supply Company**, Dallas, Tex.—From the far Southwest comes a complete catalogue of one of the largest automobile supply distributors of that territory. Inasmuch as automobile factories state repeatedly that the largest sales of autos are going to Texas and the States immediately bordering upon it, the supply business has taken a prodigious growth, as the book of the Southwestern Automobile Supply Company proves. All lines of accessories are mentioned with prices.



Convention of Packard Service Department Superintendents

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